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Views On Airmobility, BG H. E. Drebing 1

French Airmobility 4

Army Flying Down Under, MAJ Charles T. Barnett 6

"Horning In" 9

Standardization Corner 23

Annual Writ—1975, CPT James R. Walker 24

Flight Simulator Specialists Course 26
Alpheus McArdle, DAC
SFC Beryl Roach

Rapping With ARAC, CW2 Philip H. Goepp III 28

Pilot-Error Accidents Aren't All Pilot, Part III 30

A Blind Man's Look, COL Roger J. Kesselring 35

I'm A Drug Addict, CW3 Pierre R. Lefebvre 36

Write To Right 39

Yakima NOE, 1LT Howard H. Reed III 40

Five Minutes Of Chaos, CPT Charles F. Nowlin 43

Pearl 46

USAASO Sez 48

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ABOUT THE COVER

This month the DIGEST features articles from Australia, France and Germany about Aviation and Airmobility in their respective Armies. Cover by M. Dorough

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Views on Airmobility

BG Hans E. Drebing
Director of Army Aviation for
the Federal Republic of Germany

THE SECURITY SITUATION of the Federal Republic of Germany is determined for the most part by two factors—first, the development of the Warsaw Pact military potential; and second, the military geographic situation of our country. This leads to two more introductory remarks:

• The armament effort of the Warsaw Pact countries has increased with the result that the number of operational weapons systems has grown considerably.

• Soviet armament has retained its offensive nature and is showing increasing signs of an attempt to create forces with global effectiveness.

Of its land forces totaling nearly 3 million men, the Warsaw Pact has 1,260,000 men and 22,300 battle tanks stationed on the territories of the German Democratic Republic, Czechoslovakia and Poland and in the three western military districts of the Soviet Union alone. There are 7,400 out of a total of 10,000 tactical combat aircraft readily available along the USSR's western border.

It has been proven that the distinct military efforts of the Warsaw Pact are directed primarily against the North Atlantic Treaty Organization (NATO). The offensive nature of Soviet armament that I mentioned earlier clearly reveals itself in current military doctrine. According to this doctrine the conduct of operations of the Warsaw Pact Armed Forces should retain certain characteristics, some of which I would like to cite:

• Offensive operations with high speed and far reaching objectives are to be conducted by numerically strong armoured and mechanized units by day and by night. The intention is to penetrate the enemy defence rapidly and destroy forces and reserves assumed to be operating in depth.

• In order to never lose "initiative," offensive operations are supported by direct artillery fire and missile forces and by tactical aviation elements. In addition, surprise operational and tactical airborne missions are conducted in the depth of the enemy area to make a decisive contribution toward attaining this objective.

Left—German UH-1D Huey helicopters provide rapid transport of assault boats and equipment to aid Army "pioneers" (comparable to the U. S. Army Corps of Engineers). Above—A 106mm German recoilless rifle mounted on an LKW (¼ ton truck) is offloaded from a CH-53G

The "Military Strategy"* established by Sokolovsky** already states in this regard:

"By means of operational airborne landings, airborne forces of regimental or divisional strength are to support the combat missions of an operational force, e.g., of an Army or Theater force. These support missions may be to rapidly exploit the effects of concentrated nuclear strikes and to occupy nuclear weapon deployment areas, essential objectives, crossing sites, bridgeheads, mountain passes and defiles. . . ."

The Soviet Union alone has about seven airborne divisions, two of which can presumably be moved over great distances with the airlift capacity onhand. The USSR also has about 2,000 helicopters of all types, with nearly 800 being transport helicopters available to the land forces alone. Thus, it is easy to imagine the great importance attributed to airmobility by the Warsaw Pact.

The geographic situation of the Federal Republic of Germany is of equal importance when estimating the situation. The small depth of our country (between 250 kilometers at the level of Hannover

Continued on page 10

*Sokolovsky, Vassily, Military Strategy, Soviet Doctrine and Concepts, Fredrick A. Proeger, Publisher, 64 University Place, New York 3, N.Y.

**Sokolovsky, Vassily D. (Anilovich) (July 20, 1897-May 10, 1968) Russian military leader, Red Army commander on the Western Front during World War II; a head of Soviet military government of East Germany (1946-1949); supervised Berlin blockade (1948-1949); chief of staff of Soviet Armed Forces (1953-1960).

The French are seeking to maximize their support capability by tailoring each mission to current assets. Effective use of aviation resources includes not only air movement capability, but also preplanned employment subject to the threat forces, ground missions and concepts development

IN THE PAST the term "airmobility" was used by the French to describe the capability of a military unit to use air space to free itself from the limitations imposed by terrain.

Airmobility was a general term which covered all airborne operations. Included were operations carried out by specialized troops, such as parachutists, as well as the air transportation of troops with their equipment.

As a result of the development of the French concept of employment the general term airmobility has been refined and is now used in a more restrictive and precise manner. The term now describes not only the capability of air movement but also a new method of planning the technique which gives it a specific character that is tied to the general employment of helicopters.

French Army Aviation distinguishes two forms of airmobile operations.

First, the simplest employment ties to the older use of the term and is that which allows a unit to move more easily by means of helicopters. For example, when an artillery battery is moved by cargo helicopter it becomes an "airmobile battery." Another example would be when a mountain warfare company is helilifted from one pass to

Continued on page 12

FRENCH AIRMOBILITY

This article was provided by
Headquarters, French Army Aviation
78129 Villacoublay Air
Paris, France

Held and cherished in the protective grasp of a newly formed fighting arm of the Australian Army are the skills, traditions and honours derived in flying operations from World War I to the present day. Although the Australian Army Aviation Corps was formed only 6 years ago, it can trace its roots through the history of flying in Australia (the term branch is used in some armies and corps in this sense does not denote size).

This article traces the history of aviation in the Australian Army leading to its present organisation. Whilst the central theme is the Australian Army Aviation Corps, generally related topics are included to assist readers in gaining a broader understanding of military aviation in Australia

THE HISTORY of military aviation in Australia can be traced from September 1912 when the Minister for Defence approved the formation of an Army Flying Corps and the purchase of five aircraft. The first course of war-flying instruction commenced at Point Cook, Victoria, on 17 August 1914. Four Army officers attended this 3-month course and all qualified as pilots.

Following a request from the government of India on 8 February 1915 for "trained airmen, flying machines and motor-transport" for service in Mesopotamia, the Australian government responded by raising The First Half-Flight, a unit which later became the nucleus of the Australian Flying Corps. The Viceroy of India was advised subsequently of the initial details of The Half-Flight in a cable message dated 23 March 1915: "Personnel consists 2 captains, 2 lieutenants, (all as) flying officers; 1 sergeant-major, 1 staff-sergeant, 1 sergeant, 3 corporals, 12 others, total 18, all air-mechanics; 1 quartermaster-sergeant, 1 farrier-sergeant, 15 mule-drivers, 2 cooks, 4 batmen, total 23, all soldiers; 3 riding horses, 4 teams six mules, 2 teams eight mules, and 30 spare in case of difficulty with mechanical-transport in sandy country."

The First Half-Flight was later increased in size to provide a wagon section but Australia could not provide any aircraft at that time. Information on aircraft availability is obscure but it would appear that three aircraft had been procured before that date; "two Maurice-Farman Shorthorn biplanes—bought with money given by the Rajah of Gwalior for the purchase of two up-to-date aeroplanes—and a Maurice-Farman Longhorn which had seen considerable service in Egypt." These aircraft apparently were later flown by The Half-Flight, making it the first operational flying unit in the Australian Defence Forces.

Following this tenuous beginning, four complete squadrons of the Australian Flying Corps were raised. No. 1 Squadron was formed in Australia and embarked for Egypt in March 1916. No. 2 and No. 4 Squadrons were raised in 1916 and sent to England for training at Royal Flying Corps depots. No. 3 Squadron was raised in Egypt in 1916 for operations in that area.

The Battle of Cambrai in November 1917, famous as the first battle in which tanks were used, marked the advent of the Australian Flying Corps on the Western Front. The Corps acquitted itself well in this battle and went on to record many notable actions in the months to follow. It is of interest to note the association that No. 3 Squadron had with the last flight of the German ace, Baron von Richthofen in April 1918. Whilst the many claims for his demise are still disputed, the Red Baron's machine did fall into the Australian lines. His body was recovered by No. 3 Squadron which arranged for his burial a couple of days later.

The three Australian squadrons in Europe saw action up to the eve of the armistice in November 1918 and remained in that area until early 1919. They then handed over their equipment to the British forces prior to returning to Australia in May on the transport ship Keiser-i-Hind.

The final action of No. 1 Squadron in the Middle East was the Battle of Armageddon in October 1918. Prior to return to Australia, General Allenby, the theatre commander, addressed the squadron at Kantara in February 1919 at one of their last parades. In part he said:

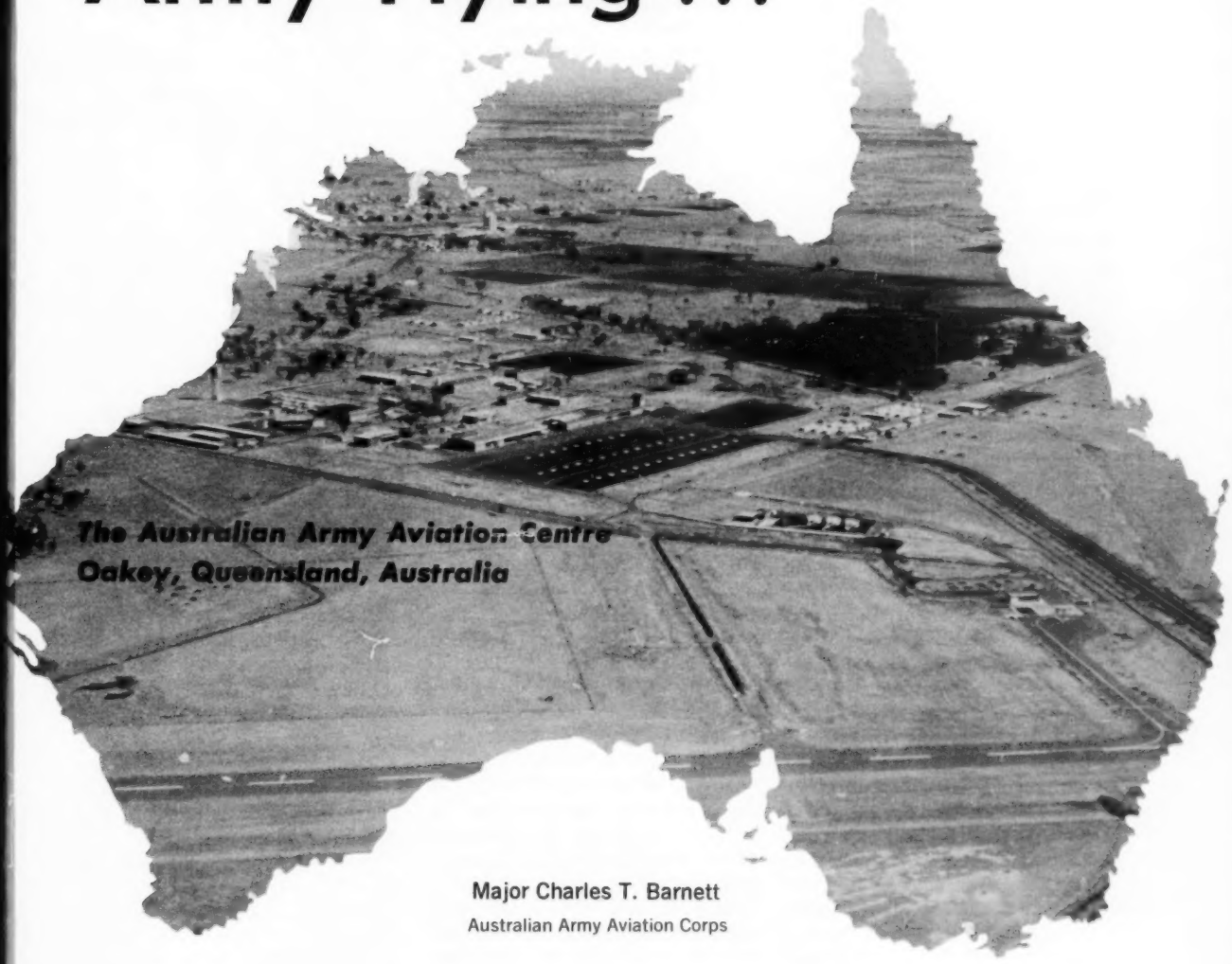
> You gained for us absolute supremacy of the air, thereby enabling my cavalry, artillery

Major Barnett was commissioned from the Royal Military College, Duntroon, Australia, in 1960. Two years later he entered flight training and served in the Republic of Vietnam in 1966 and 1967. Major Barnett commanded flying units on two occasions in Papua New Guinea, attended the RAF Central Flying School in England and later was Coordinator of the Australian School of Army Aviation. He is assigned to the Office of the Military Attache in Washington, DC

"They carried no armament and were regarded chiefly as auxiliaries to cavalry for purposes of reconnaissance."

Official History of Australia in the War of 1914-1918, Vol III, Australian Flying Corps

Army Flying . . .



The Australian Army Aviation Centre Oakey, Queensland, Australia

Major Charles T. Barnett
Australian Army Aviation Corps

Down Under

and infantry to carry out their work on the ground practically unmolested by hostile aircraft. This undoubtedly was a factor of paramount importance in the success of our arms here. I desire therefore personally to congratulate you on your splendid work. I congratulate you, not only the flying officers, but also your mechanics, for although the officers did the work in the air, it was good work on the part of your mechanics that kept a high percentage of your machines serviceable.

Throughout World War I Australian pilots also were trained in Upavon, England, for flying duties in the Royal Flying Corps (RFC) and the Royal Naval Air Service (RNAS) squadrons. Many of these pilots transferred to the Australian Flying Corps upon their return to Australia. On 1 April 1918 the Royal Air Force (RAF) was formed by combining the RFC and the RNAS. A small number of Australian pilots continue to fly with the RAF to this day.

The Royal Australian Air Force (RAAF). The Australian Flying Corps operated as a corps of the Australian Army until 1 April 1921 when the Australian Air Force was formed as a separate service of the Australian Defence Force. Later that year this service gained Royal assent to become the Royal Australian Air Force (RAAF), only 3 years after the RAF had emerged as the world's first independent air force.

The RAAF upheld the best traditions of the former Australian Flying Corps during operations in World War II, in Korea, Malaya and Borneo. During the Vietnam conflict, No. 2 Squadron RAAF was tasked to the 7th Air Force, U. S. Air Force, and was awarded the U. S. Presidential citation and the Vietnamese outstanding unit award (Gallantry Cross with Palm). As part of the RAAF development through the years, an increasing emphasis on the provision of close support to the ground forces has emerged. This emphasis is reflected by the number of utility and medium lift helicopters among the aircraft operated by the RAAF. A list of current RAAF units and associated aircraft is contained in figure 1.

Figure 1

Current RAAF Flying Units and Aircraft

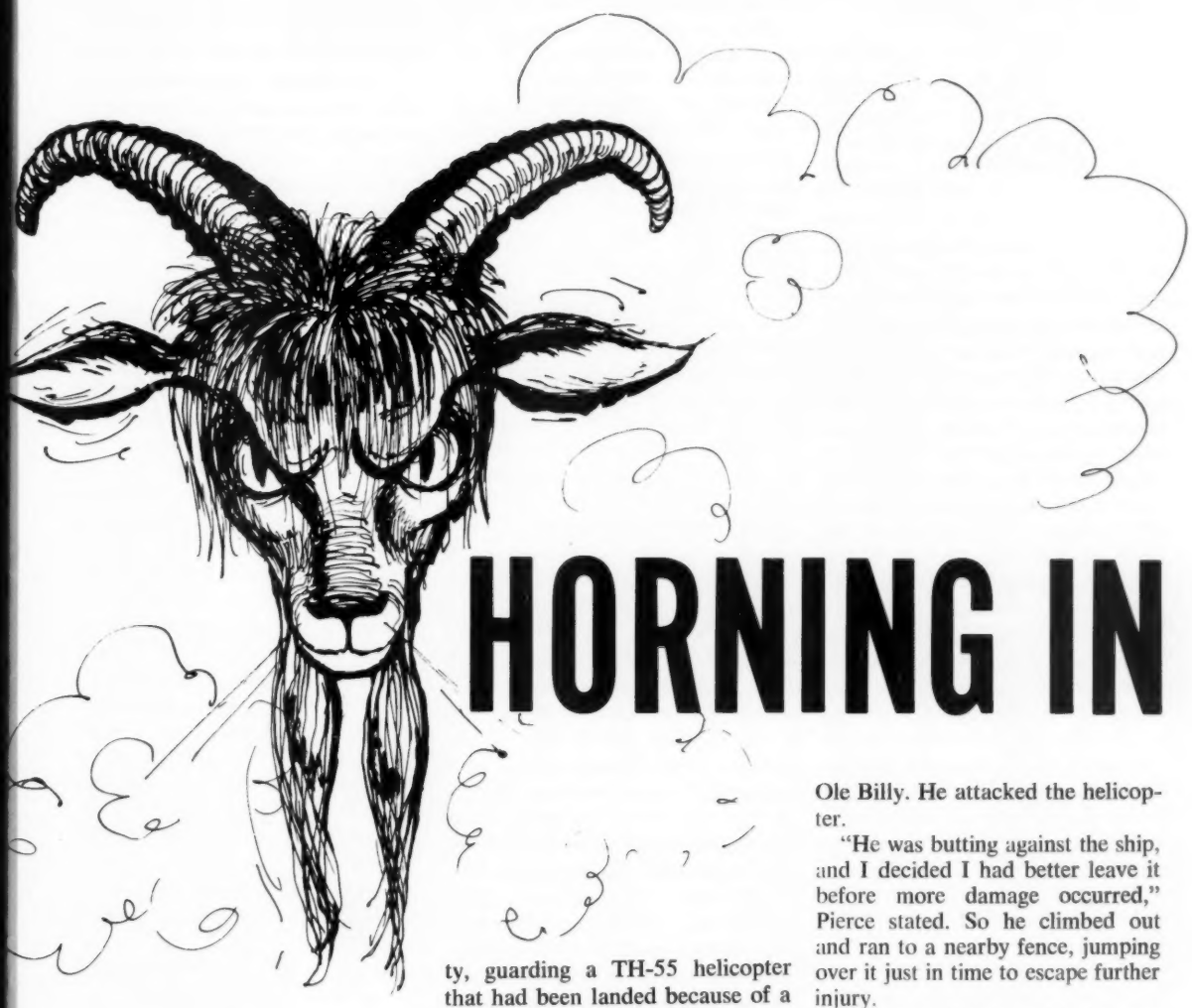
1 Forward Air Control Flight	Winjeel
3 Fighter Squadrons	Mirage III
2 Bomber Squadrons	F-111C
1 Photo Reconnaissance Squadron	Canberra
2 Transport Squadrons (MR)	Hercules
2 Transport Squadrons (SR) (incl one flight in Papua New Guinea)	Caribou
2 Utility Helicopter Squadrons (and Search – Rescue detachments)	Iroquois
1 Medium Helicopter Squadron	Chinook
1 Maritime Reconnaissance Squadron	Neptune
1 Maritime Reconnaissance Squadron	Orion
1 Special Transport Squadron	BAC 1-11, Mystere 20, HS 748
1 Flying Training School	Winjeel
1 Flying Training School	Macchi
Type Operational Conversion Units	

The Fleet Air Arm of the Royal Australian Navy. The Royal Australian Navy (RAN) operated aircraft from quarterdecks of ships during World War I and provided pilots to fly with the RNAS. However, the original plan to form a Fleet Air Arm for the RAN lapsed in 1921 when the RAAF was formed. The Fleet Air Arm was finally raised when the 20th Carrier Air Group was commissioned at Eglington, England, on 28 August 1948. The 20th Group, equipped with Hawker Sea Fury and Fairey Firefly aircraft, arrived in Australia with the newly commissioned aircraft carrier HMAS SYDNEY in May 1949. HMAS SYDNEY and her complement of aircraft served in the Korean War from September 1951 to January 1952. During one 24-hour period she launched 89 sorties, believed to be a record for any carrier of her size serving in that war. Australia's second aircraft carrier, HMAS MELBOURNE, was commissioned in October 1955 and arrived in Australia the following year with a complement of Sea Venom all-weather jet fighters and Gannet turboprop and antisubmarine aircraft.

Despite the lack of a Fleet Air Arm in the years before 1948, the policy of providing RAN pilots and observers for training and operations with the Royal Navy generated a highly experienced group of officers. The current top ranking Australian military officer—Chairman of the Joint Chiefs of Staff, Admiral Sir Victor Smith—was one of this group who quickly established aircraft as an integral part of sea operations in the RAN.

During the Vietnam war the Fleet Air Arm provided a helicopter flight which was integrated with the U. S. Army 135th Assault Helicopter Company, better known as the EMUs. This was a land-based unit, established to provide utility helicopter support to the forces in the Republic of Vietnam including

Continued on page 18



HORNING IN

IN A PASTURE near the U. S. Army Aviation Center at Ft. Rucker, there is a billy goat with a strong aversion to the Army invading his domain.

Private First Class Rickey W. Pierce, who is assigned to Company E, 30th Infantry, 46th Engineer Battalion at Ft. Rucker, has bruises to prove it. He really had no intentions of "butting" into the goat's business. He was just doing his duty, guarding a TH-55 helicopter that had been landed because of a low oil-pressure reading. The instructor and student had been evacuated, and Pierce was left to wait for the maintenance crew.

The attack was completely unexpected!

"It was threatening rain, so I was in my pup tent. All of a sudden a goat charged at me and there seemed to be feet and horns everywhere," Pierce said.

When he finally extracted himself from the tent, the goat knocked him down a time or two before he could seek shelter in the aircraft. Such diversionary tactics didn't stop Ole Billy. He attacked the helicopter.

"He was butting against the ship, and I decided I had better leave it before more damage occurred," Pierce stated. So he climbed out and ran to a nearby fence, jumping over it just in time to escape further injury.

He was still there, with the goat charging up and down the fence, when the maintenance people arrived a short while later. They were not warmly welcomed either!

The cost to repair the TH-55 is only about $100. What is noteworthy, however, is that not too many reports show the cause of damage as being a goat attack.

Of course, Ole Billy maintains that he was perfectly justified in defending the pasture because his "nanny" and kids were there. Even the Army has no right to horn in on his family!

Views On Airmobility

Continued from page 3

and approximately 480 kilometers at Augsburg); its considerably greater width; and the location of vital and particularly sensitive areas clustered close to the border do not permit us to pursue a "strategy of attrition" against the enemy. This fact has been taken into account in the concept of forward defence.

The reorganization of the Federal Armed Forces, primarily of the Army, has been accomplished on the basis of the strategy of flexible response. It not only complies with the need for the presence of strong forces but also with the requirements for forward defence. The Army's mission in case of war is to successfully accomplish this strategy in conjunction with allied forces.

The undoubted numerical inferiority of our forces makes it imperative that we recognize and exploit every opportunity to compensate for this or even change it into superiority by our own quality. We must have modern, flexible command and control; effective reconnasissance; strong firepower against tanks and aircraft; and quick formation and shifting of points of main effort, i.e., mobility of own forces.

Further effective increase of mobility on the battlefield, however, can only be achieved by inclusion of the *third dimension*. By third dimension I mean the air space close to the ground, i.e., the "air gap" between two ground swells, the flat "air shadow" behind a hedge and the narrow "air strip" of a forest cutting. Briefly, what I mean is that small portion of the vast third dimension which permits flying operations to be conducted as close to the ground as possible by the airmobility I have just described and which is the only device available at the present time—namely, the helicopter!

Airmobility enables the Army to exploit air space for transportation of troops and supplies and for antitank defence. It provides an opportunity to quickly traverse large areas and obstacles, including mountains, waters, congested roads or contaminated areas, and facilitates both command and control and combat and service support of all troops, especially the evacuation of wounded personnel.

By exploitation of airmobility, commanders can quickly influence the course of battle, even over great distances, giving more free play. This applies to all Army elements, particularly to airmobile forces, which besides airborne brigades include infantry and mountain infantry elements and the Army Aviation Corps.

In providing airmobility for the Army, the Army Aviation Corps fulfills essential requirements inherent in the objectives of airmobility:

- highest speed of reaction,
- immediate availability,
- the capability to operate in a tactically "correct" manner in support of the Army, i.e., as a means of maneuver and combat in the battle along with the combined arms of the Army.

On this basis airmobility offers the Army manifold opportunities in a variety of situations such as airborne command and control; air transport; airborne operations; and antitank combat.

In the airborne command and control role we have:

- **as equipment:** the light helicopter "Alouette II" of which a sufficient number is being held available in divisions and corps (in the late 1970s it will presumably have to be replaced by a followup model);
- **as beneficiary or user:** any commander, whose mission is to gain a quick survey over an area, to observe the course of battle, to issue decisions personally or to command operations from an airborne position, to name only a few;
- **as missions arising in this context:** liaison, surveillance, reconnaissance, observation and fire control.

Particular use is made by commanders of the opportunity to employ specially equipped helicopters—including light helicopters—as airmobile command posts.

Let us now take a look at air transport and airborne operations. The helicopters in use are the well known UH-1H, an aircraft which can move 1 ton of materiel or nine fully equipped soldiers over a distance of 300 kilometers without refueling, and the medium transport helicopter (CH-53), a technically modern and extremely efficient helicopter which now is being delivered to the field units.

The CH-53's weapons system may be compared in its complexity with a medium-range standard jet transport aircraft or a modern high performance aircraft. The introduction of the CH-53 required a variety of preparatory measures to acquaint personnel thoroughly with handling and control. It was, therefore, necessary to:

- reorganize command levels,
- improve organizational structures of aviation units,
- modernize organization in the field of aircraft engineering,
- issue new operating procedures,
- invest in infrastructural measures,
- enhance training,
- change the personnel structure.

Principles of modern management had to be synchronized with the requirements of military hierarchy for introducing the CH-53.

This planning process developed operational and organizational procedures which were oriented toward the overall command and control system of the Army and fundamentally modernized Army Aviation

Corps management. In addition to the improved centralized technology which by means of its components—

- annual flight hours program,
- annual corrective maintenance plan,
- monthly, weekly, and daily operational plans,
- established utilization rates, and
- flight tactical development programs

—controls operational functions, a central personnel management system has been established in connection with a long-term, requirement-oriented and individually controlled training plan for technical personnel. It is called central personnel and training control.

Modernizing Army Aviation's management contributed considerably toward:

- an increased operational readiness,
- a 100 percent coverage of pilot and officer requirements,
- the lowest accident rate since formation of the Army Aviation Corps,
- an increase of flight hours to more than 50 percent of the Federal Armed Forces' total flying time,
- a high training standard.

I may safely state that the qualitative improvement of the Army's combat power can and will be accomplished on a solid, steady, secure and step-by-step basis by selective development of airmobility. Within a few years an auxiliary force has developed into a combat and combat support force of ever-increasing operational and military strategic importance.

Now, I would like to direct the readers' look toward a development which will enhance the Army's airmobility considerably. Recently, the Federal Armed Forces staff put it this way: "As a result of the increasing thrust of the Warsaw Pact Armed Forces, antitank helicopter units are to become a new element of Corps nonorganic combat support troops. Provided that the tactical and technical tests are brought to a successful completion, these antitank units will provide the commanding general with a suitable instrument for rapid and effective formation of points of main effort in antitank defence."

Brigadier General Hans E. Drebing is Director of Army Aviation and Inspector for Army Aviation for the Federal Republic of Germany

An antitank helicopter is to be particularly capable of adapting to terrain while at the same time remaining independent of terrain because of its high mobility. Compared to ground vehicles it operates at much higher speeds, it can reach its operational area by the shortest possible route, and its radius of action fully covers the Corps defensive area. Therefore, it will be possible to quickly form and displace points of main effort in antitank defence.

Despite these facts, which have been reviewed and measured, there still remains the question concerning chances of survival and vulnerability of helicopters. General Hamilton H. Howze (USA Ret.) who was chairman of the U. S. Army's Tactical Mobility Requirements Board in the early 1960s stated: "The helicopter's vulnerability in non-nuclear battle is primarily a question of tactics and operational principles. If helicopters are foolishly employed, a well equipped enemy will be able to efficiently engage them. If employed with thoughtfulness and skillfulness, however, helicopters can always fully accomplish their missions with a minimum of loss."

A frame for tactics and operational principles already has been set. This is based on the ability to equip the helicopter with a guided missile system for antitank defence and not require it to operate within the range of enemy weapons. Additional criteria either are on hand and may be considered as proven—or are in the process of review (e.g., the thesis that the antitank helicopter normally can only be employed within the concept of a major formation following the principles of combined arms battle).

Experience gained from operation research studies, troop trials and planning investigations being conducted at considerable expense for more than 3 years has been taken into account along with the experience of our allies. This is being taken into continuous consideration in the trials being held by the Test Squadron at the Aviation Branch School. The overall rather complex field of mobile antitank defence will be checked for weak spots and advantages with utmost care before asking for investments.

There are indications, however, that the relationship between efforts, costs and success in the case of the antitank helicopter as compared to other antitank weapons is favourable to an unknown extent. Since in the context of future military structure economy is becoming more and more important, we hope to make a highly essential contribution to the qualitative improvement of our defensive capability.

Whatever course this development may take, the introduction of an antitank helicopter would not be a revolutionary act but rather the result of a logical evolutionary development.

FRENCH AIRMOBILITY

Continued from page 4

another—or if a commander is airborne in a helicopter for command and control purposes . . . these are utilizing airmobility. What this really means is that Army aviation is utilized to provide the ground forces with a superior advantage that can be used in a decisive manner to carry out their mission. In many cases this is only an auxiliary action which has not been preplanned but rather responds to the ground tactical situation as it develops.

The second form of airmobile operations provides more of the basic elements of the operation because of preplanning and its ability to be used for reconnaissance, fire and transportation.

Ideally, we would be able to satisfy all of the requirements for airmobility, that is to say that we would be able to conduct both the auxiliary support mission as well as the specific missions which generally are referred to as airmobile operations. But because of the limited assets of French Army Aviation, the commander is forced to impose priorities. As a result, the auxiliary or support missions are considered useful only when they facilitate the ground operation and are only carried out when they present an obvious tactical advantage such as the establishment of an airborne command post or the guidance of a ground unit during a critical phase of employment.

Bearing in mind the idea of priorities and considering the support missions, this article deals with airmobile operations and will be presented as follows:

• After the explanation of the present French doctrine the general characteristics of the airmobile op-

SA 341 Gazelle fires the HOT (wire-guided) missile. The Gazelle employs a gyrostabilized optical tracking device with magnification of 2.5 and 12 times normal for accuracy up to 4000 meters!

AH Alouette III armed with the antitank SS-11 B1 missile system (forerunner to the M-22 used on UH-1B/C/M)

erations will be developed.

• The possible employment methods will be specified.

• Finally, the means available to French Army Aviation will be briefly described.

Basic Data. Because the concepts of employment are in a state of evolution, the precise definition of airmobility is still in process in France. The subject, therefore, is only presented as a description of the *existing* situation, which will necessarily change with the accumulation of experience and the development of new equipment.

The data used to define the French concept of employment is essentially:

• The characterstic threat which has placed the priority on antiarmor warfare.

• The fact that, depending on the limitations of meteorological conditions, airmobile operations should be complementary to those which are conducted on the ground.

• The best utilization of the existing inventory of equipment.

• The budgetary limitations which delay certain highly desirable goals. For instance, the creation of peacetime airmobile units that are organically equipped and have their own infantrymen.

• Finally, the concepts which have been established from a number of tests conducted in the last few years.

Now, let us state some of the basic advantages of an airmobile employment:

• The efficiency of an airmobile formation with a long range reconnaissance mission.

• The possible "massive" employment of antiarmor helicopters with a specific mission rather than as a simple addition to the already existing ground antiarmor weaponry.

• The possible assignment to an airmobile detachment of an autonomous combat mission of a certain duration either in preparation to engage a major unit, during a critical phase in exploitation of a favorable opportunity, or to face an enemy threat.

• The possibility of intervening beyond the forward edge of the battle area (FEBA), in spite of the notable increasing risks involved, in order to carry out the missions essential to the execution of the maneuver.

• Necessary employment of nap-of-the-earth (NOE) flight, taking advantage of the most effective capabilities of the aircraft and decreasing at the same time their vulnerability.

• "Pathway flight" which is nap-of-the-earth flight that utilizes the terrain and advances from one terrain compartment to another and thus reduces and limits visual acquisition by the enemy.

AIR ASSAULT, via the SA 330 "Puma" which carries 12 infantrymen and has a 2.5 ton load capacity

Characteristics Of Airmobile Operations. What does one mean by an airmobile operation? Currently, it can be defined as an action during which the units of the ground forces participate in combat by maneuver, by fire, or both, using helicopters.

Such an action could be either entirely performed from aircraft in flight, or more frequently is the combination of actions carried out on the ground, but always adapted to the helicopters.

Let us say, to be more exact, that when the assets of Army aviation are used in order to allow or facilitate command and control or to provide the branches with technical or tactical support (for instance the adjusting of artillery fire or radiological survey) these are not primary, preplanned airmobile actions, as mentioned in the beginning of this article, but in fact are actions which can be classified as auxiliary or support missions.

A final characteristic of the airmobile operations is best defined by the amplitude of the expected effect. It is not a matter of a simple action or of local support. Its purpose, on the contrary, is to provide the capability to significantly modify a certain tactical situation.

In order to provide the most efficient employment, the airmobile units shall be given the missions which only they can accomplish because these missions require intervention out of range of the ground troops.

There are three categories of possible actions—antiarmor warfare, reconnaissance and infantry combat.

Therefore, these types of operations shall be grouped into three categories, according to their primary characteristics. These are operations in which fire is dominant, i.e., "dominant fire"; operations in which intelligence is dominant, i.e., "dominant intelligence"; operations in which infantry is dominant, i.e., "dominant infantry." Each of these operations is analyzed below under the subhead "Combat Procedures."

What can we expect from airmobile operations? Obviously the operations do not possess the same size or scope when employed at different levels such as army corps or division.

At army corps level it is a matter of obtaining information about the major enemy units, of intervening against an armor threat at the corresponding level. Examples would be an attack on an enemy corps level tank unit or maneuvering with helilifted combatants in order to obtain a significant effect.

On the contrary, at division level the objectives are more modest. The intelligence effort is usually limited to the first enemy echelon, such as their forward reconnaissance unit. The antiarmor actions often are only carried out at armored cavalry or tank company level while the helilifted operations are essentially organized with light observation or antitank teams.

To better summarize this employment of the airmobile task force the following examples of their possible assigned missions are cited:

• To prepare for the engagement of the army corps, long range information is needed. In this case the formation will consist mostly of

light observation helicopters (LOHs) and helilifted means.

• To obtain information and to delay the enemy for a nuclear strike we will conduct successive operations employing LOH and antitank helicopters.

• To seize and control a zone before the enemy advances, in order to provide later access by a major unit, we will principally use helilifted infantry.

• To face the threat of an armor breakthrough or the outflanking of a major unit, the airmobile formation will require antitank means as well as timely intelligence.

• To search, locate and destroy the enemy elements infiltrated or airdropped to our rear area, we will need systematic aerial and helilifted teams; in the case the infantry will be prevalent.

Combat Procedures. Initially the lack of predesigned airmobile units requires that they can be created and organized as the situation dictates. Their composition varies in accordance with the type of preplanned airmobile operation. Their size is determined by the size of the unit supported which usually is not smaller than several platoons.

Generally the airmobile task force combines a variable mix of LOHs, antiarmor helicopters, maneuver helicopters (MHs) and ground units, particularly infantry and engineer. This task force is then organized under a single command for the entire operation.

Because of the absolute necessity for the perfect coordination of the different elements which make up the airmobile task force, these elements are trained for a long period during peacetime to perform their combined mission.

Airmobile Operations In Which FIRE Is Dominant. These missions are conducted by flights composed of a majority of antiarmor helicopters supported by antitank teams helilifted by maneuver helicopters. If time permits, the mission can be preceded by a reconnaissance phase which is conducted by LOH. The execution of this reconnaissance mission assures the safe conduct of operation by timely intelligence collection.

The type of antiarmor helicopter in use by French Army Aviation possesses excellent observation characteristics, maneuverability, power, small size and optical observation equipment, enabling the antiarmor platoon to be employed without LOH support. However, even with the excellent observation characteristics of the antiarmor helicopter the lack of a duly constituted LOH mission will result in a less effective fire mission.

An antiarmor helicopter formation can be either grouped as one unit or subdivided into single patrols. *In the first case* the mission is executed as a large scale ambush. The advantage of this method is the effect of mass which can stop the enemy advance. The disadvantage is discontinuity in the attack because of the rapid consumption of antitank missiles and fuel. Finally, the terrain does not always afford a favorable firing position for more than about 10 helicopters.

In the second case the mission is executed as a screening and delaying action. The primary advantage is the permanency obtained by the possibility of relief and a lower vulnerability particularly from the hostile artillery.

These two methods are not separate and can be used in succession during the operation.

The guidance of the antiarmor helicopters to the attack position is a key point since unguided employment results in delay and also increases their vulnerability.

The guidance mission can be carried out either by LOH during autonomous actions or by an Army aviation liaison officer, equipped with an LOH. If a liaison officer is used he will be attached to the major unit being supported or more rarely to the ground unit itself.

The combined air and ground actions performed by antiarmor units are very delicate; they require an extensive study of the terrain in order to obtain the maximum advantage. Because of the absence of combatants organically assigned to French Army Aviation units, the desired cohesion is lacking and makes this type of action difficult to carry out. This situation also requires extensive previous training.

The need for rapid embarking and disembarking prohibits the movement of motorized antitank teams by helicopter. The "Milan" missile and hand carried explosive charges represent the basic equipment of the helicopter moved airmobile antitank teams.

Operations In Which INTELLIGENCE Is Dominant. These generally are carried out by LOH formations. Their action also can be supplemented with light infantry teams landed by maneuver helicopters; the infantry teams provide for permanency on the ground. The antiarmor helicopters provide the necessary security and can even participate with fire during reconnaissance. The compactness and maneuverability of the French antitank helicopter permits this type of employment and crews are trained with this objective in mind.

The unit searches for information either in an autonomous manner well ahead of a major unit, within a specific zone, on a flank or in coordination with the reconnaissance elements on the ground.

The intelligence gathering mission is performed against enemy forward units, reconnaissance units or against elements deep behind the enemy's frontline. In this last case, depending on the risks involved, the action will be aimed against the nondeployed enemy formation moving on roads in terrain that is favorable to infiltration by our helicopters. This terrain usually is wooded and rolling. This militates

in favor of the employment of the airmobile assets while we are on the move toward the enemy.

The phase during which penetration is made by the airmobile unit behind the enemy's first echelon is delicate, but it seems possible in many situations in modern warfare.

For reconnaissance missions the LOH platoon is organized in patrols of two or three aircraft. Each patrol receives a corridor containing only one principal axis. The depth of the corridor is essentially variable, depending on the situation, the range of the aircraft and the tempo of the enemy advance.

Flying low level, the formation reaches the FEBA where it will risk exposure to direct enemy observation and fire. Beyond this line the formation breaks into several patrols utilizing NOE flight. The role of the platoon leader now consists of maneuvering his patrols and of relaying the information collected.

Airmobile Operations In Which INFANTRY Is Dominant. Depending on the availability of time for the maneuver, airmobile operations allow infantry elements to intervene on objectives which are inaccessible by ground travel due to terrain obstacles or because of the disposition of the enemy.

These operations can be conducted in three phases:

- The reconnaissance of the combat zone and the neutralization of the enemy weapons which is generally done by aerial means.
- The helilifting of combat units which can be picked up again in order to be reemployed if the situation demands it.
- The seizure and occupation of objectives.

The general principle to be applied in the employment of the maneuver helicopter, which prevails in this type of engagement, is expressed by the saying, "French Army Aviation does not use its cargo helicopters specifically for transport, but rather employs them as maneuver helicopters."

Consequently, it is necessary to take advantage of the flexibility of the helicopters.

The airmobile maneuver of the infantrymen provides for their delivery to an assault position which is close to their objective and they will be in a tactical configuration as near as possible to the one in which they are going to fight when landed. Aerial delivery of the infantry also allows the troops to position themselves to maneuver the enemy within the desired zone of action. The primary need is that the organization must be adapted as close as possible to the ground maneuver. The engagement phase begins as soon as the troops from the first helicopter touch the ground.

The maneuver helicopter sections are most often organized to carry a combat platoon.

This airmobile operation is conducted in a defensive or in an offensive situation in the friendly rear area or in the enemy rear. It also is used for raids (especially if the two opponents are closely intermingled) on a key point or zone of terrain where immediate control is necessary for the development of a major maneuver.

In the engagement of the enemy by the ground units, speed of execution and surprise are generally required.

After this brief description of three possible types of airmobile operations let's see now who leads the provisional formations, and how, in practice, this command and control is to be exercised.

Today we cannot find in French Army Aviation any permanent organization to command these operations. The study of this particular problem is in the process. However, it is possible to talk about certain principles with which we are experimenting.

As far as the airmobile operations with "dominant infantry" are concerned the command is assigned to an officer who comes from an army corps or a division headquarters. This officer is assisted by an Army aviation advisor and a ground forces advisor.

For airmobile operations with "dominant intelligence" or "dominant fire" the command is more often assumed by an Army aviation officer in flight, even though some antiarmor or intelligence teams might be landed.

The question is to determine whether this command should be exercised from the air or on the ground.

The practice of command in an aircraft flying NOE is difficult, particularly for a staff officer who might not be familiar with the flight environment. In addition, the endurance of the helicopter does not permit continuous coverage of the operation and, as a result, continuity must be provided by the command post (CP) relief helicopter.

Thus, the following procedures are recommended: First, the operational commander boards his CP helicopter with his Army aviation advisor. The ground forces advisor embarks in a maneuver helicopter with communication equipment, lands on a high terrain point near the action zone and sets up a CP. Second, as soon as the communication links are established, the commander joins his ground CP from which he exercises his command. Thereafter his CP aircraft is only used in a critical situation.

The necessity for rapid configuration of an airborne CP for this type of operation has been clearly pointed out during past field training exercises (FTX). It appears that this task can be carried out by the Army aviation staff of the army corps.

The resupply organization must ensure the necessary delivery of missiles and petroleum (POL) at the desired moment and place. The

resupply points must be carefully chosen so that they will be out of range of the enemy but still close enough to avoid needless fuel consumption in order to afford ample time on target.

The MH, with its flexibility and speed, can easily perform this type of resupply. New devices such as auxiliary tanks which can be used for the refueling of other aircraft and light fuel pumps with a high rate of delivery are being tested. This new equipment will provide the rapid establishment of a forward area rearming and refueling point (FARRP) with an acceptable risk level.

This technology will increase the duration of airmobile task force action, however, it is in fact only an addition to the classic ground logistics system.

Units Organizations: First, let's remember that French Army Forces are composed of three types: the forces of maneuver, the forces for operational defense of territory and the intervention forces (airborne).

An Army aviation unit is assigned to each category. We will now examine the structures of these units.

In the forces of maneuver, an Army aviation "group" is found at army corps level. It is organized with three elements equipped with about 20 MHs, 15 antiarmor helicopters and 12 LOHs.

At division level a divisionary unit is equipped with two LOH squadrons of about 20 aircraft, an antiarmor platoon of 10 helicopters and a maneuver squadron of half-a-dozen MHs.

We do not have any organic Army aviation units below division level.

For their employment, Army aviation assets are under the orders of the major unit commander. However, in the army corps headquarters there is a small Army aviation staff acting as technical advisors and specially provided to organize provisional airmobile formations obtained from different units. Reinforced with personnel and materiel, this Army aviation staff is capable of performing airmobile operation command functions.

The airborne intervention division has its own Army aviation unit with a greater number of MHs than are allotted to the other divisions.

All of these Army aviation units, from the divisions or Army corps, are grouped in a variable manner, depending on the situation, in order to accomplish the airmobile operations already described above. Temporary airmobile formations can thus be assembled from existing assets of an army corps aviation unit or from several divisionary Army aviation units.

As for the Army aviation units of the forces for operational defense of the territory, they are characterized by a smaller size; about six LOHs, six light observation fixed wing aircraft and some liaison airplanes. In wartime the National Territory is divided into grids which are called "defense zones." Each zone will receive an Army aviation unit. Because of their limited assets these units can only provide assistance for the exercise of command. Their involvement in the airmobile operations described in this article is only incidental.

French helicopters are all turbine powered and include: maneuver helicopter, Puma SA 330; antiarmor helicopter, Alouette III equipped with the SS-11 missile and supplemented by the Gazelle SA 341 armed with the HOT missile (high IR subsonic optically-guided) and LOH, either Alouette II or SA 341 without its armament.

The French airmobile concept is formulated from basic principles which are essentially as follows:

- The Army Forces aerial capabilities are organized and committed to the priority destruction of tanks, which is the primary goal of today's ground combat.
- At major unit level there is only one concept for ground combat. This concept integrates the action of the ground and aerial elements in order to ensure their most effective use against the enemy on the battlefield.
- Compared to the other types of the Forces combat vehicles, the number of helicopters is relatively small. Thus, we will select only the employment offering a significant advantage to the maneuver of the major unit.
- In its execution, airmobile combat is a combination of successive actions conducted in conformity with the specific characteristics of the ground Army Forces aerial assets.

Based on these principles, an experimentation period of many years has brought to light employment methods and combat procedures.

The actual French Army Aviation structures are not fixed. Studies are in process which may require us to reexamine the question of the repartition of the aircraft between army corps and division. It is possible, moreover, that in the future a more precise distinction will be made between the aircraft assigned to support missions and those destined for airmobile formations.

Today, French Army Aviation organizes its means and restudies its structures in order to obtain better adaptation to the new concept herein defined.

Train to Win

Down Under

Continued from page 8

the First Australian Task Force, a brigade-size formation with an area of operations embracing most of Phuoc Tuy Province.

The range of aircraft operated by the RAN has the capability of providing the intimate air support required by ground forces. The squadrons and aircraft of the Fleet Air Arm are shown in figure 2.

Australian Army Aviation Corps. Experience in World War II gave strong indication that certain flying duties would best be carried out by Army pilots. In 1950 it was agreed by the Chief of General Staff and the Chief of Air Staff that Artillery pilots should fly aircraft on Air Observation Post (Air OP) duties. Those Army pilots already trained were then posted to No. 3 (Fighter Reconnaissance) Squadron at RAAF Fairbairn near Canberra, equipped with Auster Mk III aircraft for Air OP duties. In 1953 this unit was disbanded and 16th Air OP Flight was raised in its place.

In 1957 the 1st Aviation Company was raised in Sydney to supplement the limited support provided by 16th Air OP Flight. This unit consisted of a small group of Army officers and noncommissioned officer pilots who operated civil aircraft on charter to the Army.

In 1960 the Defence Committee endorsed a plan for the formation of the 16th Army Light Aircraft Squadron, to be based at Amberley, 25 miles west of Brisbane, Queensland, and to be equipped with fixed and rotary wing aircraft, the maximum all up weight of which was not to exceed 4,000 pounds.

In December 1960 the 16th Air OP Flight and the 1st Aviation Company were disbanded and 16th Army Light Aircraft Squadron was formed. The unit was equipped with Army owned Cessna 180 (fixed wing) and Bell Sioux 47G2 (rotary wing), both modified for military use.

Figure 2

Current Fleet Air Arm Flying Units and Aircraft

1 Strike and Fighter Squadron	A4G Skyhawks
1 Fixed Wing Anti-submarine Squadron	S2E Trackers
1 Helicopter Anti-submarine Squadron (above units are aboard HMAS MELBOURNE)	Wessex 31B
1 Fighter Pilot Training Squadron	Macchi and Skyhawk
1 Helicopter Training/Search and Rescue Squadron	Iroquois and Scout
1 Anti-submarine Helicopter Training Squadron	Wessex 31B
1 Pilot, Observers and Crewman Training and Communication Squadron	S2E Tracker Dakota HS748

From this beginning to the occupation of the new Army Aviation Centre at Oakey, 80 miles west of Brisbane, there have been many milestones in Army Aviation. The 16th Army Light Aircraft Squadron became the 1st Aviation Regiment and the Army assumed responsibility for aircraft maintenance, originally carried out by RAAF engineers. In 1965 a permanent detachment of Cessna 180 airplanes was sent to Port Moresby in Papua New Guinea Command and later that year the 161st Reconnaissance Flight was deployed to Vietnam. In 1966 the 182nd Reconnaissance Flight was deployed to Malacca, Malaysia, to support Australian forces in the 28th Commonwealth Infantry Brigade and, subsequently, saw active service in Borneo.

In 1968 the 183rd Reconnaissance Flight was deployed to Lae, Papua New Guinea (PNG), and the original detachment withdrawn. The 171st Air Cavalry Flight was deployed to Holsworthy, near Sydney, New South Wales.

By this time Australian Army aviators had established themselves as a viable element of the arms team. The service provided by them in Vietnam, Malaysia, PNG and Australia had been invaluable and the experience gained provided a springboard for future expansion. The hours flown had increased six-fold since December 1960.

On 1 July 1968 the Australian Army Aviation Corps was formed as a separate branch of the Australian Army, next in seniority after Infantry. In December of that year the Australian Cabinet approved the development of the Army Aviation Centre. The movement from Amberley to the Aviation Centre was completed in 1973 and the major units of the Corps and its supporting Base Workshop Battalion of the Royal Australian Electrical and Mechanical Engineers are now based there.

Aviation units from Vietnam and Malaysia have been withdrawn and with the reorganisation of the Corps and the Army they have been renamed and redeployed to optimise aviation support to the Army. One factor affecting this reorganisation is the provision of an Australian-built fleet of aircraft, twin-engined Nomad fixed wing and Kiowa (OH-58) rotary wing.

Industrial Base of Australian Aviation. With a few exceptions Australian pilots always have been equipped with foreign-designed aircraft. However, wherever it has been possible the aircraft were built or assembled in Australia. The importance of producing any war material locally is well known to the Australian services and the Australian government. Production of small numbers of aircraft, particularly the more complex types, is not economical, but the requirement for Australia to maintain the ability and the industrial capacity to build aircraft when the need arises remains paramount.

The first Australian-built aircraft to fly was built by Mr. J. R. Duigan in a shed on a sheep station, 80 miles from Melbourne. He flew this aircraft on 16 July 1910. The first mass production of aircraft commenced during the 1920s when de Havilland Aircraft and another company made de Havilland Gipsy Moths in relatively small numbers. Large-scale production of aircraft and engines became possible in 1936 when six major industrial companies decided to form the Commonwealth Aircraft Corporation (CAC). In addition to this the Australian government gained an aircraft production facility through an Australian/British agreement in 1939 to establish an Aircraft Production Branch within the Australian Department of Supply and Development. This branch later became the Government Aircraft Factories (GAF). Meanwhile, de Havilland had entered large-scale production of Tiger Moths to meet the expanding aero club market. The RAAF selected the Tiger Moth as a basic trainer and thus increased the demand for local aircraft. By August 1942, 1,035 of these had been made in Australia.

During World War II Australian production of most components became a necessity. The three major companies, CAC, GAF and de Havilland, produced a wide range of Australian and foreign-designed aircraft and engines built under licence. Whilst the RAAF operated many types of foreign-made aircraft, Australian production contributed to establishing the RAAF as one of the largest air forces in the world by the conclusion of World War II.

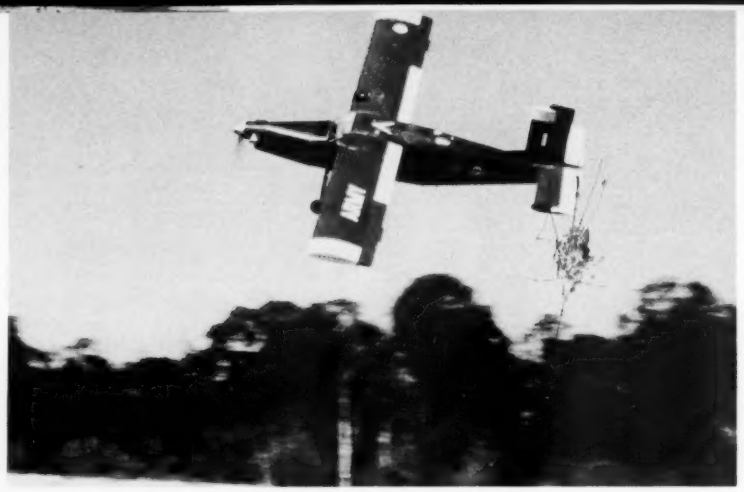
The industrial base for aviation which was developed during World War II has continued to provide the Australian defence forces with operational and training aircraft, engines and spare parts, ranging from the French Mirage III to the Nomad, an all-Australian designed and built twin turboprop, highwing monoplane STOL (short takeoff and landing) aircraft. The U. S. aircraft currently in production with CAC is the Bell 206B-1 Kiowa helicopter for the Australian Army.

One of the biggest problems in a numerically small nation is to maintain economic production lines in time of peace. This is illustrated by the story of Victa Limited of Australia, manufacturers of the Victa Airtourer. Designed by Henry Millicer, the chief aerodynamicist at GAF, this light, two-seat aircraft won a Royal Aero Club of Great Britain competition against 103 other competitors. When production in Australia ceased in 1966, 170 Airtourers had been built. Following the failure of attempts to gain a government subsidy, Victa Limited sold world rights to manufacture Airtourer to Aero Engine Service Ltd. (AESL) of New Zealand in 1967. New Zealand-built Airtourers are now being imported by Australia to meet the demands of the RAAF and the civilian market.

Two other companies which have designed and built aircraft in Australia in recent years are Yeoman Aviation, the makers of Cropmaster, and Transavia Corporation, the makers of Airtruk, an agricultural or multipurpose aircraft.

The aviation industry in Australia is supported by a modest but well-equipped group of laboratories. While the nature of the work undertaken in these laboratories is primarily designed to solve those problems which may be unique to Australia, they have made many worthwhile contributions to other

The Nomad is powered by twin turboprops. It is a STOL aircraft that is designed and built in Australia



The Pilatus Porter is a turbine powered STOL aircraft. It's currently in the inventory but will be replaced by the Nomad

nations in solving problems in areas where they have world-recognised expertise.

Over the years Australia has established an aircraft industry which has produced a wide range of aircraft in the numbers required, yet its future continues to be clouded. The spasmodic nature of defence needs combined with a specialised and comparatively small commercial market makes economically viable production runs difficult to achieve. The industry is reliant upon assistance from the Australian government for its continued growth.

Operational Experience. Although Australian pilots gained valuable experience flying with allies in theatres of World War I and II, much of this experience was confined to the service involved—be it Army, Navy or Air Force. Professional jealousies were to be expected at lower levels and much dedicated staff work was required to ensure that interservice cooperation was maintained. The present division of responsibility between the Army and Air Force stems from lessons learned in times of war.

The need for cooperation between the services was emphasised in World War II when operations were being conducted over the swamps and the jungles of Papua and New Guinea. During a particular operation in the Mubo area of Papua in mid-1943, Major General Stanley Savige, commander of the Australian 3rd Division, reported that the Air Force response to Army requests for air support was slow. He said, "Until an air support tentacle with the necessary communications is established in forward areas, quick support is not possible. Even so, with all communications working at ideal speed, owing to the distance which the support aircraft have to come from airfield to target area, a minimum of 2 hours would elapse from time of request to time over target, during which time the situation will have changed."

Comments such as this led to the formation of a RAAF/Army cooperation wing to support ground forces on Bougainville. A study of the role of the newly-formed wing leads one to wonder how difficult it must have been to gain mutual support during preceding operations. World War II records described this wing as follows: "An Army cooperation wing was essentially nonoffensive in character. As its name implies, it worked with Army forces providing them with a number of essential services—namely, tactical reconnaissance, artillery reconnaissance, supply by air to troops, antimalarial spraying and the 'lead-in' of attacking squadrons. It was never allowed to carry out offensive operations, but it was permitted to attack 'targets of opportunity.' Each Army cooperation wing comprised the following tactical units: (1) Tactical Reconnaissance Squadron; (2) Local Air Supply Unit; (3) Air Observation Post Flight."

In a similar manner experiences gained more recently in Korea, Malaya, Borneo and Vietnam operations have provided the three Australian services with further opportunities to test and revise their mutually supporting doctrine, establishments and procedures in the use of aircraft to support the ground battle. Some of the procedures and divisions of responsibility between the services are unique to Australia and could prove to be unworkable if it were not for the level of interservice cooperation required and achieved.

For example, RAAF utility and medium lift helicopters are now closely associated with Army observation helicopters in close support of the Army in the field. The Army helicopters form an integral part of an Infantry division while the RAAF squadrons are allocated as required in a supporting role. Once allocated, the RAAF pilots must quickly develop an affiliation with particular units and gain a better and more intimate understanding of ground force operations.

The problems arising from joint service command relationships are many but at the working level this affiliation, combined with mutually developed procedures, has provided quick and effective air support for ground force operations. Even so, the constantly changing equipment, tactics and enemy threat parameters require continual reassessment and possible modification of existing procedures.

In Australia the process of reexamination and change continues. Care is taken that valuable experi-

Figure 3
Regiment Headquarters

(3) Reconnaissance Squadrons Each 9 LOH	Air Cavalry Squadron 9 LOH	Division Operational Support Squadron 9 LOH	Division Aviation Regiment Workshop

ence gained by association with American, British and other allied forces is developed along suitable national lines. The resultant doctrine is checked to ensure that it remains consistent in principle with that of our allies.

Australian Army Aviation—Now: In a recent review of the Infantry Division, it has been recommended that fixed wing aircraft be removed from the Australian Army Divisional Aviation Regiment. This would increase the flexibility of the regiment and simplify maintenance since all squadrons in the division would then be equipped with Bell Kiowa 206 B-1 light observation helicopters. To meet the tasks required of the Divisional Aviation Regiment, the study proposed an organisation as shown in figure 3.

In addition to the Divisional Aviation Regiment, there would be a squadron of 12 fixed wing aircraft (Pilatus Porters, to be replaced by Nomad) in Army troops, available for use by the Divisional Commander as required. This squadron is currently based at the Army Aviation Centre at Oakey. Where possible, a squadron of the Divisional Aviation Regiment is collocated with the task force (brigade-sized formation) to which it is under command. By doing this the task force gets maximum aviation support while the squadron and other units develop a close affiliation during training.

Task of Army Aviation. Bearing in mind that the RAAF operates utility and medium lift helicopters, the following tasks are allocated to Army aviation:

Main tasks are:

- battle field surveillance and air reconnaissance
- provision of airborne command and control facilities
- artillery observation
- liaison and communication duties

Other tasks include:

- message dropping, air letter services, carrier services, air photo delivery
- cable laying
- carriage of personnel and equipment to establish, maintain and recover radio relay stations
- radio rebroadcast
- airborne radiological survey and monitoring
- insecticidal and herbicidal spraying
- those normally performed by RAAF and other aircraft which include: photography, aeromedical evacuation and carriage of freight and personnel

While these are the tasks performed in war, there are many occasions when Army aircraft are used on other tasks. The largest commitment of this nature is in support of the Royal Australian Army Survey Corps. For many years Army aviators and surveyors have been working together throughout Australia, Papua New Guinea and Indonesia. At best, in most of these areas, the existing maps could be described as inadequate. Survey operations provide excellent training for Army aviators in applied flying techniques and for junior commanders in deployment of aircraft and aviation units in remote locations.

Throughout the first half of 1974 cyclonic weather and heavy rains caused all low lying areas of the eastern states of Australia to be heavily flooded, in some cases the worst flooding for 100 years. Army aviators and their RAAF colleagues provided invaluable support to civilian agencies during this difficult period. They saved many lives not only by rescue activities but also by emergency supply of food, medical supplies and fodder to outlying areas cut off by the floods. During last summer one of the worst locust plagues in Australia's history provided another occasion for Army aviation to assist the community. As with the support of survey, the flying carried out on these emergency tasks broadens the experience of the Army pilot. It also utilizes his training and provides good public relations with the community.

Aircraft Operated by the Australian Army. Although Army pilots flew Austers in the 16th Air OP Flight until 1960, the first aircraft to enter the Army inventory since 1921 were the Cessna 180 (modified) and the Bell Sioux 47G2, to be followed later by the G2A and G3B1 models. Initially the Army was restricted to a 4,000 pound all up weight (AUW) limitation but this was lifted to enable the purchase of Pilatus Porter turbine-powered STOL aircraft with maximum AUW of 4,850 pounds.

In Vietnam, the 161st Reconnaissance Flight operated Sioux and Cessna aircraft initially, to be later

replaced by Porters and the Bell Kiowa. As earlier explained, the Kiowa (modified for the Australian Army) is being locally manufactured and is replacing all G3B1 model Sioux. The GAF Nomad, a STOL twin-engined turboprop, highwing monoplane now coming into service, will replace all fixed wing aircraft. The Nomad and Kiowa are both powered by 400 shaft horsepower Allison 250 turbine engines. This standardization, combined with the reorganisation of Army aviation in the Infantry division, should greatly reduce maintenance and spare parts problems during peace and war.

Training. All pilots in the Australian Defence Forces are commissioned. Student pilots attend No. 1 Flying Training School at RAAF Point Cook near Melbourne. This school is staffed by qualified flying instructors (QFI) from the three services and students receive basic training on fixed wing aircraft.

Following basic training, students attend the School of Army Aviation at Oakey. The school has three wings:

• *Advanced Flight Training Wing.* Here students are qualified on type aircraft and this wing conducts almost all other flying training.

• *Corps Training Wing.* In this wing , air traffic controllers and aircraft handlers are trained and courses for promotion subjects peculiar to aviation are conducted.

• *Tactics Wing.* This wing conducts operational flight training courses, and troop and squadron commanders' courses.

On completion of advanced flight training, students attend the operational flight training course. This course culminates in a field exercise designed to simulate the pilot workload by type and number of flying missions and other duties that the average Army pilot would be expected to carry out on operations. The qualified Army pilot is then posted to a unit and following familiarization with unit procedures soon becomes a regular member of the team. During this posting a pilot normally will attend a survival training course. As his career progesses he will return to the school for attendance at tactics wing courses to prepare him for command appointments.

If a pilot is selected for instructor training he could be trained at the U. S. Army Aviation Center, Fort Rucker; the RAF Central Flying School in the United Kingdom; or in Australia at the RAAF Central Flying School at East Sale, Victoria.

By having instructors trained in these establishments it is possible to keep abreast of training methods and select those which are most suitable for further training. Because numbers are small it is possible to program the same student with the same instructor for a complete phase of training. By this method the student will receive continuity in his relationship with the one instructor. However, during the course, students may change instructors either to get the maximum benefit from this system or to overcome any incompatability that may arise. Because single pilot aircraft are operated and pilots are in many cases unsupervised, this method has proven successful in producing a well-rounded, mature pilot. Of course, the rest is up to the individual and, more importantly, his unit commander.

The Australian Army Aviation Corps celebrated its sixth birthday in 1974, making it the age of the Australian Flying Corps when the RAAF was formed. With a sound training system producing good pilots and the new Kiowa and Nomad aircraft coming into service, the Corps is entering an exciting phase of an already colourful career. However, there is a continuing need to extend the capability of men and machines.

The Corps has been accepted as a member of the arms team in the Australian Army. With an imaginative, dedicated and realistic approach to Australia's defence policies, the members of the Australian Army Aviation Corps are accepting the challenge to develop the techniques and procedures required to complete their task as part of that team.

The Bell 206B-1 "Kiowa" is being produced by the Commonwealth Aircraft Corporation for the Australian Army

STANDARDIZATION CORNER

THE FOLLOWING is a partial quote (paragraph 1 has been deleted) from Headquarters Department of the Army message of 3 January 1975 concerning touchdown autorotations. Because of the importance to aviators and its directive nature, the communication warrants wide dissemination.

2. The following coonstitutes HQDA policy guidance on practice touchdown autorotations based on the accepted conclusion that, as a minimum, the current policies and procedures have been effective in Army aviation accident prevention efforts. The policy and procedures criteria concerning practice touchdown autorotations considered minimum are stated herein for single engine helicopter day operations:

A. Practice touchdown autorotations shall be conducted only under the following conditions:

(1) During formal courses of instruction at USAAVNC [U. S. Army Aviation Center].

(2) During rotary wing transition flight training courses which have been approved by appropriate authority.

(3) During standardization instructor pilot, instructor pilot, and aviator periodic standardization evaluation flights.

(4) When deemed necessary by the appropriate commander.

B. When practice touchdown autorotations are conducted, the following criteria shall apply:

(1) Be controlled by the local standardization board as an organized and closely supervised program.

(2) Be conducted only in designated training locations that have air-to-ground communications, crash/fire rescue facilities available, and are free from obstructions. A method for opening and closing the training area shall be established.

(3) Be conducted only in dual-control equipped aircraft with a qualified instructor pilot at one set of controls who is current and proficient in practice touchdown autorotations in the mission, design and series helicopter being flown.

(4) Only the minimum flight crew required shall be aboard the aircraft during practice touchdown autorotations.

(5) No more than six practice touchdown autorotations per instructor pilot and/or student shall be performed during any one-hour instructional period. Consecutive one-hour autorotation instruction periods should not be scheduled in any one day.

(6) Practice touchdown autorotations involving turns will be initiated at sufficient altitude to enable the aircraft to be established straight-in to the touchdown area at no less than 200 feet AGL.

(7) Practice low level touchdown autorotations may be performed at designated training locations subject to the following conditions:

(a) Approach zones must be sufficiently clear of obstructions to permit visual contact with the point of intended landing from autorotation entry to termination.

(b) Entry speeds and altitudes will be as specified in flight training publications for aircraft flown.

(c) Autorotations will be straight-in, maintaining a constant ground track. Speed reduction climbs or "pop-up" type entries will not be performed.

(8) Unanticipated surprise practice touchdown autorotations will not be performed.

(9) Minimum ground-run autorotations should not be construed as requiring precision touchdown or zero ground-run autorotations. The intent of practice of minimum ground-run autorotations is solely to reduce the risk of accidents.

C. Forced landings and power recovery/terminate with power practice autorotations are encouraged and may be conducted where:

(1) Forced landing recovery is initiated so that descent is terminated at a minimum of 200 feet above the highest obstruction.

(2) Power recovery/terminate with power practice autorotations are conducted to an approved training area only.

D. Practice hovering autorotations (aircraft in stationary hover) are excluded from the above minimum criteria; however, unanticipated surprise practice will be eliminated except for instructor pilot training.

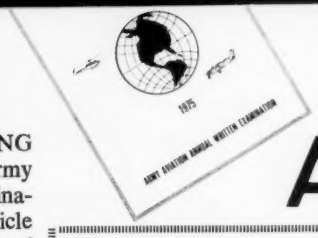
3. The policy and procedures criteria concerning practice touchdown autorotations considered minimum are stated herein for multi-engine helicopter day operations:

A. Practice touchdown autorotations with all engines out of flight position are prohibited.

B. Practice of single engine flight to touchdown shall conform to the criteria of paragraph 2, where applicable.

4. The criteria as outlined in paragraphs 2 and 3 above for day practice touchdown autorotation training for both single and multi-engine helicopters will be complied with for night operations. In addition, specific training locations should be designated and equipped for the conduct of practice touchdown autorotations at night.

5. Renewed command emphasis will be directed toward continuing and further education, training and supervision of practice touchdown autorotations.



Annual Writ-

THE PRIMARY TESTING period for the 1975 Army Aviation Annual Written Examination begins next month. This article provides a preview of the "annual writ" and, hopefully, will encourage all aviators to use the study guide preparing for the exam.

Let's start with the last point. This year's writ has been pre-tested by a group of 170 representative aviators. Those aviators who at least reviewed the study guide in advance, completed the writ nearly 45 minutes sooner and scored 10 percent higher than the others. That was the average, of course, because there was no way to gauge actual effort expended on the study guide. However, it was apparent from observations and aviator comments, that the scores increased as the study effort increased. So the opening commercial is obvious: the real professional will approach the annual writ just as he does every other mission—fully prepared. And that preparation will come from concentrated, advance effort on the study guide.

To assist you, the study guide has been revised to improve its usefulness. Probably the chief objection to previous study guides has been that the arrangement of questions required extensive skipping about among the various references. Two changes have been made to minimize this problem. First, the scope of each question has been reduced so that one publication will provide the answer; and, second the questions have been grouped by type publication. There is a general section with sample problems which require reference to more than one publication. However, in general the 1975 study guide is designed to focus attention on one publication at a time and thoroughly familiarize you with its contents. Using the study guide as a self-teaching tool will increase your professional knowledge and fully prepare you.

Now, let's take a look at the exam itself. Generally, it is similar to past exams. The main components are still the examination booklet, the reference data booklet (RDB) and the reference publications packet. Once again, the exam contains 50 multiple-choice questions, about half related to instrument flight rules procedures and the rest to a variety of aviation and related subjects.

Although similar to previous annual writs, there are some changes worth noting. For starters, the reference data booklet is about half the size of last year's. All information not specifically required for work on the study guide or exam has been eliminated. This not only provides a more compact, easier-to-use reference, but also reduces the cost. The only change in the reference packet is the addition of two references: AR 95-16, Weight and Balance—Army Aircraft; and FM 21-26, Map Reading.

There are only three versions of the 1975 exam. You can take any version regardless of your aircraft or instrument qualification. "Fixed-wing-only" versions have been eliminated due to the reorientation of Army aviation to virtually an all-helicopter force, and the overall success of the Department of the Army program to qualify all aviators as rotary wing pilots. Despite this, the relatively few fixed wing only aviators will have no problem with the exam. The last notable difference in this year's exam is the inclusion of aircraft performance charts and tactical map reading as subjects for questions. More detail on this will follow.

To get more specific and look at the type of questions you can expect, we will consider the following categories of questions:

Instrument Flight Rules. As mentioned earlier, this subject constitutes about half of the exam. Some of you may find these questions particularly challenging, primarily because they focus on key points which are rather complex and frequently misunderstood. This description is based on interviews with instrument examiners; instrument instructor pilots; standardization instructor pilots; and on the analysis of the 1974 examination results. The questions in this section cover the following subjects:

- destination, alternate and approach weather requirements
- air traffic control communication procedures

Objective and Philosophy

My office assumed responsibility for the Aviation Written Examination some months back. I was warned right out front that it was a rather thankless task; that no matter how much time and effort was expended, the consensus could only be "too easy," "too hard" or "too chicken." In thinking back, I have to admit that with only one or two exceptions, that's how I have categorized the twenty or so annual writs I have taken.

It seems to me that the writ can be more than just another dirty chore to be accomplished by Army aviators. The challenge is to design an examination which will increase the aviator's knowledge and familiarity with publications and essential procedures and sharpen his overall annual writ should be a rather than an elaborate g

With this in mind, som established:

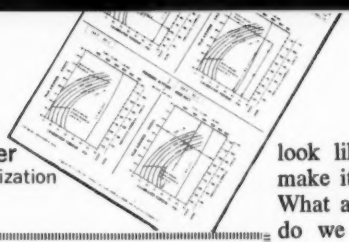
—Make the aviator wor when he finds an appropri is the answer.

—Avoid "nit-picking" q much as possible on need-

—Don't be concerned because if the learning nothing wrong with every 100 percent.

–1975

Captain James R. Walker
Office of the Deputy for Standardization
Fort Rucker



erall skills. In other words, the be a type of refresher training ate game of "gotcha"!

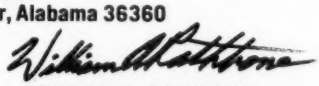
some simple guidelines were

work to get through the writ but ropriate answer, make certain it

g" questions and concentrate as need-to-know items.
rned about arbitrary pass rates ning objective is met, there is veryone passing or even making

In the companion article, CPT Walker goes into some of the details of the 1975 annual writ. We got part way to the objective this year, and we'll do better next year. Our minds are open and if you have any suggestions or recommendations for improvements, please send them in to:

Commander
United States Army Aviation Center
ATTN: ATZQ-S-P
Fort Rucker, Alabama 36360



WILLIAM A. RATHBONE
Colonel, TC
Deputy for Standardization

- emergency procedures
- navigation instrument interpretation
- fuel requirements
- general preflight, enroute and arrival procedures

Unless you are *thoroughly* familiar with the above subjects and know exactly where to find the applicable requirements and procedures, you must use the study guide to prepare yourself.

General Aviation Subjects. Although general aviation covers a wide range of subjects, it is not a particularly difficult area. The questions cover:

- safety
- the Aviation Standardization Program
- terrain flight (nap-of-the-earth) training
- aviation general provisions and flight regulations

Performance Data Charts. The subject is new and so are the charts themselves. Performance Data Charts will be incorporated into the revised-format operators manuals (-10s) which are scheduled for distribution to the field this summer. Here again, you will encounter little difficulty, if you have used the study guide. The sample problems and step-by-step explanations will provide the required "know how." Sample charts and instructions are also contained in the RDB.

Tactical Maps. This is also a new subject. To conduct successful terrain flight operations, especially nap-of-the-earth, the aviator must be able to read and interpret tactical maps. Tactical planning subjects to include analyses of areas of operation may be included in future writs. This year, however, the questions address only basic map reading skills. You are encouraged to use the study guide.

That's the 1975 annual writ in brief. Preparations are already underway for the 1976 version. What will it and other future writs look like? What can be done to make it more useful and relevant? What are the weak areas and how do we correct them? These and other questions are being studied in a continuing effort to improve the examination and increase its usefulness. Some of the possibilities being considered are to:

- Increase tactics emphasis.
- "Weigh" portions of the exams, either by question or section, to give appropriate credit for the more difficult and time-consuming items.
- Adapt the exam to the various situations encountered by aviation units because of their locations or missions. This might be accomplished by providing to the field a selection of "standard" questions so that the writ could be tailored locally to fit the situation. In effect, each installation or area standardization board would produce and administer its own writ. An alternative method would be to retain the present centralized preparation but design different versions for the various locations in which the exam would be administered.

Our improvement efforts are not limited to the examination—the study guide is receiving equal, if not more, attention. Suggestions for improving the study guide generally fall into two extremes. One school of thought is that the guide should be replaced by a "sample exam," simply multiple-choice questions which parallel the actual writ with, of course, answers and reference sources included. Another view is that the study guide should be expanded into a *true* programed text, i.e., contain instructional material and questions. It might even include extracts of pertinent publications so that the aviator would have all the necessary material in one publication.

That's our preview. We hope it has been informative and will help you prepare for the exam. Good luck on Annual Writ '75.

Captain Walker is a project officer with the Publication Division, Deputy for Standardization. He graduated from flight school in 1965 and is a Senior Army Aviator. The author has a B. Sc. degree in Business Management

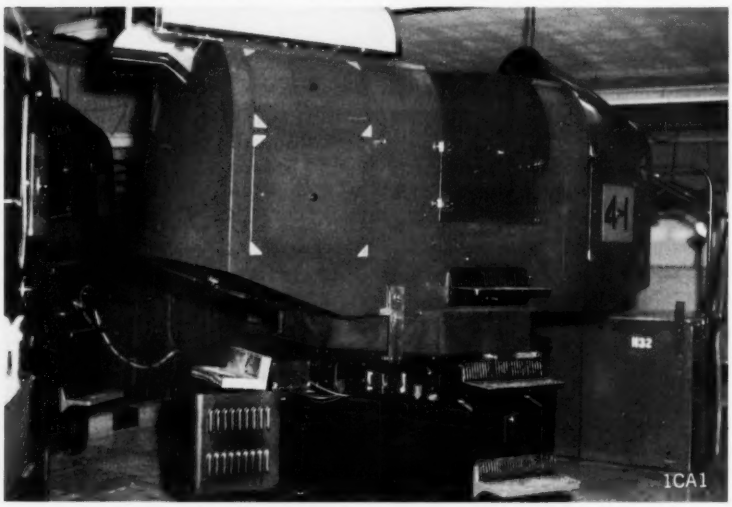
Flight Simulator Specialist Course

Alpheus McArdle, DAC SFC Beryl Roach

Senior Instructors 93D Course

Last month AVIATION DIGEST described the synthetic flight trainer system (SFTS) in the article "The Wonderful World of Simulation" by MAJ Robert L. Catron. The following article describes the training that must be completed to be a qualified instructor for the SFTS

To move from the basic Flight Simulator Specialist to the instructor on the SFTS you need Flight Simulator Course Phase II.



FLIGHT SIMULATOR SPECIALISTS often are fond of saying that they must know as much about instrument flying as a rated aviator. If the program of instruction for the Flight Simulator Specialist Course, Phase I, conducted at the U. S. Army Aviation Center at Fort Rucker is any indication, they are perfectly right. It shows that they spend about 12½ weeks studying basic instruments, basic navigation and advanced navigation. And just to round off things they learn how to maintain the equipment and spend a few additional hours on methods of instruction, map reading and human development.

When students finish Phase I, they are qualified operators or instructors in the 1CA1, 2B3 and 2B12A type trainer. To qualify in the new Synethetic Flight Training System (SFTS) (2B24) they must study Flight Simulator Course, Phase II—also conducted at the Aviation Center—for an additional two and a half weeks.

Both phases of the course are primarily for enlisted personnel. As a prerequisite for Phase I the individual must have completed basic training and have 11 months or more of active duty service remaining after completion of the course. He also must have a standard score of 90 or higher in aptitude area on the GT or ST.

Students are selected for Phase II of the course if they are assigned or on orders to an installation equipped with SFTS. They must have completed Phase I.

Upon graduation enlisted personnel in grades E-5 and below become operators with an MOS of 93D20. E-6s and above are classed as instructors with MOS 93D40.

In Phase I, 41 hours are spent learning to maintain the 1CA1 trainer. This training enables the student to perform 1st and 2nd as well as limited 3rd echelon maintenance on the 1CA1.

The second part of Phase I consists of 86 hours on basic instruments. Students learn aerodynamics, definition of terms pertaining to the theory of flight, gyro instruments and the principles on which they operate, the pitot static system and the instruments that use pitot systems and their operation.

During the basic instrument phase, students learn ways to control the flight attitude of the trainer, to make the trainer perform as the aircraft would on straight and level flights, how to climb, how to descend and how to make turns to predetermined headings. In other words, they learn to control the trainer in any attitude in which an aircraft might be flown during instrument flight conditions.

The third part of Phase I is 141 hours of basic navigation. Four hours are devoted to methods of instruction. Students receive the avionics of the 2B3 rotary wing basic instrument trainer, learn voice procedures used by both the pilot and aircraft controllers and the use of the Department of Defense Flight Publications (DOD FLIP).

In automatic direction finder (ADF) procedures, students learn to orient themselves, track to a station making good a predetermined track, intercept a predetermined track to and from a station, make ADF approaches and enter holding patterns using proper entry procedures as prescribed in the Airman's Information Manual and the DOD FLIP. The students go through an ADF problem with an orientation track interception, tracking inbound, entering the holding pattern and making an instrument approach. They must participate as both instructor and pilot.

After ADF, the students study VHF Omni Range. The same procedures of orientation, tracking, holding and approaches are followed here.

The study of advanced navigation takes another 148 hours. In this, students study emergency procedures, instrument landing system (ILS) and ground controlled approach (GCA).

The study of weather also is part of advanced navigation. Students must learn weather hazards to flight and teletype sequence reports. In addition to weather they also study flight regulations FAR, Part 91 and AR 95-1 and air traffic controller procedures, enroute and terminal.

While studying advanced navigation, six hours are spent on DOD FLIP covering enroute charts, the IFR Supplement, and the VFR Supplement Section 1 and 2. Students learn to operate the MB4 navigation computer to figure ground speeds, fuel consumption and estimated times of arrival (ETA).

Up to this point the students have had no contact with the aircraft they will be simulating. To familiarize them with the equipment, they are given a ride in the aircraft. While on the ride they observe a student on instrument training with a qualified instrument pilot. They see what a flight instructor does and how he communicates with his flight student.

By this time the simulator students are able to do some practical work. To test their ability, they are given two simulated cross-country problems which take about 12 hours each. The first is with ADF procedures. On this they will be required to go from the Enterprise non-directional beacon (NDB) to the Brantly NDB, down to the Florala NDB and back to Cairns Army Airfield. They then are required to reverse the route.

When they have made a satisfactory ADF cross country, they are given a VOR (Very High Frequency Omnidirectional Range) cross-country problem. They may be required to go to Montgomery, AL or Columbus, GA or start at Columbus and come back to Cairns.

On these cross-country rides, the students work in pairs. One will act as the instructor and the other as the pilot. They are required to figure flight plans with ETAs and reach these within plus or minus three minutes.

Unlike Phase I of the Flight Simulator Specialist Course, the SFTS Phase II is a self-pacer type. It allows students to progress at their own best speeds.

There are 12 individual lessons in Phase II. Currently the only media of training in this phase is through programed text. In the future, however, students also will be able to use "sound and slide" or educational television.

During Phase II, students learn how to start, runup and shutdown SFTS cockpits. These cockpits are duplicates of the UH-1 controls, panel and control touch. They must know the cockpit so well that they can answer questions or be able to instruct a pilot from outside the cockpit.

Students must be able to operate the console that controls the cockpit. From the console they can control 13 flight parameters and conditions. They can project wind into a simulated flight as well as insert rough air conditions, turbulence and hail. They also can induce 103 malfunctions such as radio failure, engine failure or even something as serious as tail rotor gearbox failure.

Only the Aviation Center at Fort Rucker has SFTS 2B24s at the present time. Students are selected for training under the Phase II program as they are needed. When the equipment is installed at other installations, additional students will be trained to satisfy those requirements.

RAPPING WITH ARAC

Army Radar Approach Control (ARAC) works with the knowledge that the approach phase is the most critical part of the entire flight. Controllers like pilots who listen, use ATIS, speak when spoken to and especially aviators aware of problems unique to local areas.

CW2 Philip H. Goepp III

BELIEVE IT OR NOT, that voice of authority that you hear in your earphones while flying instrument flight rules (IFR) belongs to a real, live human being. Contrary to popular opinion he is neither sipping a cup of coffee in his warm "blockhouse" not really caring about your perilous battle with the elements nor snickering gently as you enter the cell of precipitation which is blotting out his scope. No, more often he is fully as tense and nervous as you are and usually more so because his responsibility extends not only to your aircraft but also many others and his mistakes as yours could cost lives. He knows this and as a result he is typically one of the most dedicated, professional, highly-skilled individuals you will ever meet.

To make matters worse this poor fellow deals not only with ordinary people day in and day out, but also with us pilots—Army, Air Force, Navy, Marine, Coast Guard, airline, general aviation—with an incredible range of training, aircraft and equipment experience. To determine if perhaps we couldn't ease this fellow's burden a bit, at least where Army pilots are concerned, we visited the controllers at Cairns Approach Control at Cairns Army Airfield, Ft. Rucker, and cornered them with a few questions during a lull in traffic.

Cairns Approach serves the United States Army Aviation Center at Ft. Rucker, so it can hardly be called typical. Also, many of the comments concerned training situations rather than normal IFR. But since IFR training is carried on by the Army worldwide, these tips passed on by the Cairns controllers should be of use to everyone.

First, we were happy to discover that the controllers as a group have a high regard for pilots generally and Army pilots in particular. We do, however, have a few flaws which we could, with a little attention, eliminate.

We talk too much. Yes, it's sad but true. We have, according to this audience, a tendency to relate our life history and future intentions when a simple "ID (identification)," "position," "altitude," or some such call would suffice. Controllers with operational radar do not need much to go on, and when they're busy they don't want much. Now, en route IFR reporting is fairly well standardized (don't, by the way, give a full position report to a radar approach control, whether they have said "radar contact" or not). If in doubt give "ID" and "position" and they'll ask for whatever else they need (this is according to controllers).

Often problems arise with initial

calls while in visual flight rules (VFR). Keep your call short, request only one approach at a time and don't give your whole story the first time you key the mike, especially if they're busy. "ID, over" works fine, and it gives him a chance to put you off for awhile if he's got something pressing to handle.

Another fault we have while we're talking too much is not listening enough. For the controller to keep you from hitting someone, he's got to be able to talk to you. Listen for him. If you miss your call sign a few times not only does the controller tend to get a little irritated but also you've probably lost your place in the traffic sequence. As a result you may have to wait awhile to get back in. This isn't for revenge, it's for safety, so don't feel persecuted when it happens. And while we're talking about radio work, another request from the controllers: please acknowledge all calls using at least enough of your call sign to satisfy the controller that he's talking to the right aircraft. It is not usually necessary to repeat instructions, but by all means do so if you are not certain of his instructions.

We asked if there was much of a problem with pilots making procedural errors and discovered with glowing pride that instances of actual "mistakes" are very isolated and not considered a significant problem. With the Army's recent rush to get everyone instrument qualified, this is truly gratifying and commendable.

Another question that drew a surprise was whether or not Army aviators were perhaps a little quick to declare an emergency. The controllers all felt that Army aviators are, in fact, a little too hesitant to discuss their problems openly (fear of paperwork?) and are more likely to come up with "Ah, we'd just like to set her down and look at something" than "And would you have Flatiron and crash trucks standing by?" if something is going wrong with the aircraft.

This is not a problem though, we were told, because under the new controller's "regs" the controller can declare an emergency for you any time he deems it necessary. But remember, you don't have to declare an emergency to ask for a little protection or a little expedited handling. That's automatic for an aircraft reporting any difficulty, emergency or not.

Another problem that's begun to crop up at Cairns and possibly elsewhere is the matter of VFR versus IFR missed approach. If a controller asks if you intend "full stop or missed approach" and you answer just "missed approach," *that means* the missed approach procedure depicted on your approach plate unless he specifically states "maintain VFR on missed approach." If you change your mind on final and want to make a nonstandard VFR missed, tell tower to advise Army Radar Approach Control (ARAC). They won't, otherwise, at most facilities.

If you are planning to terminate IFR after the approach tell the controller before he hands you off to tower. If he has an aircraft assigned to make an IFR missed and doesn't hear from him because the pilot decided to go somewhere for some VFR work and didn't tell anyone, the controller must track down that aircraft before he can clear anyone else for an approach or to use the missed approach facility. This creates a real monkey wrench, so be careful. If he doesn't specify a VFR missed, don't do one.

A minor complaint, and this one comes from radar, tower and approach controllers nationwide: If there is an Automatic Terminal Information Service (ATIS) at the facility please use it and report that you have that information when contacting air traffic control. This is especially true if you are a VFR aircraft calling for radar advisory or a practice approach. Proper use of the ATIS can significantly reduce controller workload and increase safety.

At the time this article was written, CW2 Goepp was an instructor in the R/W Instrument Branch, Aviation Center

So much for what pilots do wrong but what, you may ask, happens when a controller does something wrong? What should a pilot do then? Well, if it requires immediate action you should of course bring it to his attention and work it out. If it can wait, however, make a note of the incident and then take a moment to drop by at ARAC and talk it over with the supervisor, preferably in the manner of constructive criticism. This will get results a lot faster than yelling at the guy over the air or telling the man's supervisor that you *demand* that he be hung. Go in with a we-can-work-this-out-civilly attitude and great things can be accomplished.

Air traffic controllers have a very difficult and by and large thankless job. If they do it right no one says anything. If they err the whole world may hear about it. Along with the above mentioned niceties that can smooth out and improve pilot-controller relations another may be a quick visit during a not-too-busy period to the control room itself for an informal chat with the controllers there. Watch them work for a while, then you will see what the traffic picture looks like from the other guy's point of view. You can learn a great deal from a visit to any ATC facility, especially one that you regularly use—not just to learn about ATC in general but also about that facility's special problems and unique procedures. It will make you a better pilot and often allow you to ease the controllers' burdens during a busy period. They appreciate that sort of thing.

CW2 John R. Kennamore,
CW3 James R. Callen and Darwin S. Ricketson
Directorate for Technical Research and Applications
U. S. Army Agency for Aviation Safety

PILOT-ERROR ACCIDENTS AREN'T ALL PILOT

PART III

TWO ARTICLES titled "Pilot-Error Accidents Aren't All Pilot" appeared in the January and February issues of the ARMY AVIATION DIGEST. The first article presented a model which could be applied to all accidents involving human error (pilot and nonpilot) and explained how errors can be both self-imposed and imposed by others. The second article presented three tables that listed task errors, system inadequacies and remedial measures and explained how they could be used in investigating human error to better describe what happened, why it happened and what can be done about it. Use of these tables was illustrated with a hypothetical example of an accident involving human error. Due to space limitations, the tables were used to explain the role of only one of four personnel whose errors contributed to the accident.

This article is intended to fill this gap by using the tables in the February issue of the AVIATION DIGEST to analyze the role of all personnel whose errors were significant factors in an actual accident. This analysis requires complete accident information but accident reports are privileged and strictly regulated. Therefore, it was decided to select an accident on which a full collateral investigation was performed and use this information in the analysis. Presented below is a narrative of the collateral board's findings with dates, places and persons changed. Tables 1 through 4 show human error reports on personnel whose execution of duties/responsibilities (tasks) was found to cause or contribute to the accident. (The codes contained in these tables appear in tables 1, 2 and 3 of the article published in the February issue of the AVIATION DIGEST.) These reports demonstrate that a large amount of specific constructive information can result from careful analysis of actual accidents. Last, it is hoped this series of articles shows that "pilot-error accidents aren't all pilot" and that each member of the team must "do it right" in order for Army aviation to measure up to standards of professionalism.

Collateral board narrative of accident. In February 1971, the 555th Aviation Company (AH) was reactivated at Fort Nix, TN, to be a highly proficient antiarmor attack helicopter company. The unit was to engage in 15 weeks of intensive antiarmor training prior to deployment to Europe. However, the aircraft were not received until July 1971, so the intensive antiarmor training was never accomplished. From February through June, the pilots did essentially nothing but read the technical manuals on the AH-

TABLE 1
Human Error Report: Pilot

Name	SSAN	Duty
Flier, R. G.	000-00-0001	P

Item	Code	Explanation
Task	26	To fly the AH-1G within maneuver limitations of TM 55-1520-221-10 during a demonstration flight.
Error	2.D.5	Pilot performed an unauthorized aerobatic maneuver at an altitude insufficient for safe recovery, a violation of par. 3-2, chapter 3, AR 95-1.
Inadequacy	19.1	Pilot felt that during the demonstration flight by another crew, capabilities of the AH-1G had not been fully demonstrated to the spectators and decided he would show them what it was really capable of doing. Following mishap, pilot stated he was "showing off" the capabilities of the AH-1G.
Remedy	20	Aviators must control emotional impulse to impress others of their flying ability and perform only maneuvers for which they are trained.
Inadequacy	19.3	Pilot was overconfident in the capabilities of the AH-1G. Following mishap, pilot stated he had successfully executed this maneuver "many times" in AH-1G aircraft.
Remedy	40.1.B	Formal schools should place more emphasis on maneuver limitations outlined in TM 55-1520-221-10 and the consequences of exceeding these limitations.
Inadequacy	18.3	Pilot used poor judgment in his decision to execute the so-called "return to target" maneuver, which was not in the planned demonstration flight, and the altitude (400-500 feet) from which the maneuver was initiated.
Remedy	30	Unit commander initiate appropriate action against the pilot in accordance with findings of the board.
Inadequacy	17	Limited flying, no meaningful training and rumors of an impending unit move resulted in a general feeling of frustration and unrest among unit aviators.
Remedy	18.B	Commander should take immediate action to initiate a meaningful training program and provide a suitable location for implementation.
Inadequacy	65.1	The unit accident prevention program was ineffective due to lack of a safety SOP, infrequent safety meetings and a lack of emphasis on safety by unit commander.
Remedy	14.B	Unit commander should ensure development and implementation of an accident prevention program and monitor unit compliance in accordance with par. 3-1, chapter 3, and par. 4-3, chapter 4, AR 95-5.
Remedy	27	USAAAVS should make wide dissemination of board's findings via AVIATION DIGEST and FLIGHTFAX.
Task	13	To file a flight plan in accordance with par. 4-6, section 2, chapter 4, AR 95-1.
Error	1	Pilot failed to file flight plan or receive appropriate clearance for flight.
Inadequacy	18.3	Lack of unit emphasis on abiding by regulations resulted in a low self-discipline level of pilot, hampering his judgment on the necessity of coordinating with unit operations.
Remedy	20	Pilots must recognize that the responsibility for proper flight coordination rests as much with the aviator as with operations and supervisory personnel in accordance with par. 1-17, section 2, chapter 1, AR 95-1.
Inadequacy	65.1	Lack of emphasis on enforcement of regulations by the unit commander resulted in frequent violations of AR 95-1 by unit aviators.
Remedy	22.2	Appropriate commander should monitor unit's compliance with AR 95-1.

1G. When the aircraft did arrive, only limited flying was performed and there was no meaningful training. These conditions caused a feeling of frustration among the aviators and a sense of futility within the unit.

The main body of the unit departed for Europe on 17 October 1971. But the aircraft were not available

TABLE 2
Human Error Report: Commander

Name	SSAN	Duty
Leader, J. J.	000-00-0002	CO

Item	Code	Explanation
Task	5	To monitor unit performance in accordance with regulations and standing operating procedures.
Error	4.D.1	Failed to ensure unit performance and training were conducted in accordance with AR 95-1, AR 95-5 and standing operating procedures.
Inadequacy	18.3	Unit commander permitted flight demonstration to be conducted without proper authority in accordance with par. 6-11, chapter 6, AR 95-1. Also, unit commander displayed an unprofessional attitude and set an improper example for unit aviators by participating in a similar demonstration prior to the mishap, even to the extent of letting unauthorized passengers ride in front seat of the aircraft, some with small children sitting on their laps in violation of par. 1-15B, chapter 1, AR 95-1. These actions contributed to laxity in conformance with regulations and a general feeling of apathy among unit aviators.
Remedy	30	Appropriate commander should initiate action against the unit commander in accordance with findings of the board.
Inadequacy	43	Salt water damage resulted in aircraft being grounded for extended period of time, hampering training.
Remedy	22.7	Appropriate maintenance personnel should ensure that proper preservative and preventive measures are taken to avoid salt water damage when aircraft are transported or stored where salt water damage may occur.
Inadequacy	47	Unit was unable to conduct desired training program at home station due to a civilian noise abatement program.
Remedy	8.B	Appropriate commander should initiate action to ensure that unit is relocated to a permanent location where required training can be accomplished.
Inadequacy	65.2	Higher command failed to provide adequate guidelines for training and monitoring of unit's activities during training in accordance with par. 4-2, chapter 4, AR 95-5.
Remedy	22.2	Aviation officer of appropriate command should monitor unit's activities to ensure compliance with AR 95-1, AR 95-5 and appropriate directives.
Task	3	To provide a written SOP governing unit's activities and training in accordance with par. 3-1, chapter 3, AR 95-5.
Error	1	Unit had no written unit SOP, safety SOP or training SOP.
Inadequacy	18.3	Unit commander's disregard for regulations, safety, command responsibilities and staff advice resulted in an unprofessional attitude among unit aviators and staff, affecting their motivation, judgment and performance.
Remedy	22.2	The command to which a unit is assigned should ensure unit has an accident prevention plan and required SOPs and provide necessary assistance for implementation. It should also ensure units are following prescribed procedures after implementation in accordance with chapter 4, AR 95-5.
Remedy	14.B.4	Unit commander should ensure that written SOPs covering all aspects of unit activities and training are provided and implemented.

until the middle of November when they arrived in Le-Harve and were flown to Etian Army Post, France. Because of salt-water damage, the aircraft were then grounded until December, at which time the condition was remedied and the USAREUR checkrides were started. Other than the checkrides, most of the flights were "do nothing flights" with little or no training value.

The unit's arrival at Etian Army Post coincided with, and proved to be the deciding factor in, an antinoise campaign/demonstration led by a local district magistrate. This resulted in more stringent local flight regulations which curtailed night flying, eliminated weekend flying and significantly reduced training flights in the Etian area. This prompted the unit to move to Verdon during 3-14 May 1972 to accomplish unit training and complete semiannual flight minimums.

Due to noise abatement problems, unit relocation sites had been under constant consideration since the unit's arrival. Rumors of a pending unit move caused further unrest in the unit.

Repeated testimony by witnesses from the 555th disclosed that no adequate aviation safety program existed. Although the unit was formed in February 1971, there was no aviation safety SOP and safety briefings were rare. Witnesses also testified there was great difficulty in obtaining current flight publications, technical manuals and Army regulations. This, coupled with the commander's apparent disregard for regulations, command responsibilities and the advice of the unit safety officer (e.g., clearing his own flight demonstration and flying of dependents), contributed to an unprofessional environment, laxity in conformance with regulations and a general sense of apathy within the unit.

The unit mission as given in the TO&E was "to increase the combat effectiveness of the unit to which assigned or attached by the employment of direct aerial fires in offensive and defensive action." Although a true mission statement, it was not an antiarmor mission, as understood by personnel within the unit. The prevailing feeling within the unit was that there was no real mission.

In sum, the main problems encountered by the unit were lack of an explicit mission, nonavailability of regulations, few opportunities to fly or train, an impending unit move within USAREUR and no active aviation safety program. These problems and lack of their solution by the unit commander, MAJ Joe J. Leader, created the atmosphere which led to the events of 8 and 10 May 1972.

On 8 May 1972, the unit commander organized and led an unauthorized aerial demonstration with four AH-1G aircraft. Following this demonstration, three of the aircraft, piloted by MAJ Leader, CPT Appleton and CWO Claus, were used to give pleasure rides to unit dependents and French Nationals, which is in direct violation of Army regulations.

The events leading to this accident were initiated on 8 May 1972 when WO Jones approached CPT Planner, the unit operations officer, and requested per-

TABLE 3
Human Error Report: Operations Officer

Name	SSAN	Duty
Planner, L. E.	000-00-0003	OPS OFF

Item	Code	Explanation
Task	27	To advise the unit commander on the authenticity (legality) of a planned demonstration flight, either before or after the unit commander approved the mission.
Error	1	In accordance with par. 4-7c 13, section 3, chapter 4, FM 101-5, operations officer failed to inform unit commander that the planned demonstration flight was not properly authorized.
Inadequacy	16	Motivation of the operations officer in performing his duties was affected by the attitude and leadership of the unit commander.
Remedy	20	Self-monitoring of operational requirements by the operations officer would result in better control and coordination of unit's mission.
Inadequacy	65.1	Operations officer received no formal briefing on unit operating procedures or his duty position when assigned, and unit had no SOP covering operational requirements available for operations officer to read.
Remedy	22.1	Unit commander should ensure that when personnel are assigned to a duty position they are fully briefed on all aspects of their duty and should have appropriate literature, such as SOPs, FMs, ARs and unit policies, relating to their duty position.

mission to conduct a flight demonstration and static display for members of a French glider club who wanted to get a close look at the AH-1G. This request was relayed by CPT Planner to the unit commander without reference to the authenticity (legality) of the mission. The flight was approved by the unit commander and was to include a demonstration of nap-of-the-earth tactics, normal flight around the airfield and landing near the glider club for a static display.

On 10 May 1972, WO Smith and WO Jones preflighted the AH-1G and found it to be in flyable condition. They performed the flight as planned and landed in the vicinity of the assembled club personnel. Upon completion of the demonstration, CWO Flier, who had observed the flight from the glider club area, felt the capabilities of the AH-1G had not been fully demonstrated and asked if he could fly the aircraft for an additional demonstration. WO Jones agreed. CWO Flier was the pilot and CWO Ryder was the copilot during this demonstration. (After the mishap, CWO Ryder stated he was only ballast for the aircraft.)

Their flight began with two right 360-degree hovering pedal turns, followed by a takeoff to the west until reaching an altitude of approximately 50 feet. The pilot then made a sharp right turn and a low-level (50 feet), high-speed (100 knots) pass on a heading of 120 degrees, within 15 meters of the crowd. The pilot proceeded 1 mile on this heading and then performed a quick stop maneuver. The aircraft rose to approximately 100 feet above ground level while the pilot was executing a right turn which essentially reversed the heading. The pilot then placed the aircraft into a dive toward the crowd at speeds up to 110 knots at a very low altitude (3 to 5 feet) on a heading of approximately 320 degrees. Passing the crowd, the pilot initiated an abrupt cyclic climb to roughly 400 to 500 feet above ground level, approaching zero knots airspeed and possibly a negative g condition.

This was followed by a 180-degree right pedal turn which, because of an already excessive nose-high pitch attitude, placed the aircraft in a steep dive of from 50 to 70 degrees on a heading of 170 degrees directly toward the crowd. The aircraft remained nose low for approximately one-half of the dive and then rotated upward to a slightly nose-high attitude, remaining in this pitch attitude until impact. Upon impact, the aircraft struck and killed four people. The aircraft slid 420 feet from the point of impact, and the cockpit section eventually came to rest in an upright position. The aircraft was totally destroyed upon impact with a minor postcrash fire resulting. Both pilots were assisted from the wreckage by U. S. Army personnel at the scene and were taken by UH-1 helicopter to an Army hospital.

TABLE 4
Human Error Report: Copilot

Name	SSAN	Duty
Ryder, B. O.	000-00-0004	CP

Item	Code	Explanation
Task	26	To maintain strict air discipline regarding regulations and rules governing AH-1G maneuver limitations (TM 55-1520-221-10) and spectator safety during flight demonstrations (par. 6-20a, c and e, section IV, AR 95-1).
Error	1	Copilot failed to indicate disapproval in accordance with Army aviator's duties (par. 4-4c, chapter 4, AR 95-5) even after the pilot had initiated a third unauthorized, unsafe maneuver.
Inadequacy	16	Copilot stated after accident that he was only ballast in the aircraft and in no way was associated with the accident, which indicates lack of initiative and motivation.
Remedy	30	Unit commander should consider performance of copilot and take action necessary to prevent reoccurrence.
Inadequacy	58	Lack of specific Army personnel responsibilities in current Army regulations applicable to instances where others violate regulations and/or place the aircraft, crew or others in jeopardy.
Remedy	17.3.B	Include in appropriate regulations responsibilities for Army personnel to indicate disapproval when others violate regulations or otherwise jeopardize the aircraft, crew or others.

USAAAVS Colonel Roger J. Kesselring, USAR

A Blind Man's Look

Colonel Kesselring is a graduate of the Infantry Officer Career Course and the School for Inspectors General. He is a former inspector general with Headquarters, Fifth Army, and is now Inspector General, 416th Engineer Command (Construction), Chicago, IL

SO THE SECOND blind man said, "No, it feels like a wall," and the third said, "This elephant feels like a rope." Like the five blind men in the story describing the elephant, some of us see aviation safety through different eyes.

As a nonrated type, my views come from the back seat of the aircraft. It's enlightening to see what my presence back there generates. Did the pilot actually see that I was strapped in properly? Did he look to see if this ground-pounder left a strap hanging out of the back door? Did he look to see that the door was closed and latched securely? How about reminding me that the sleeves on my fatigues were rolled up? I have wondered on occasion why the copilot didn't think he needed gloves just because he was in the other seat.

I have watched two young men go through their preflight check of an aircraft, find a questionable area and apparently in the interest of mission completion, pursue it no further. They did not ask me if I was in a hurry, so I wondered why the crew chief was not consulted for his expertise. I have also watched other pilots go through that lengthy checklist, knowing how many times they must have done it before. I anticipated enjoying my ride much more as they meticulously covered each and every item, using the book.

I must admit to a degree of annoyance when a cloud shelf moved underneath us one day while we were in an OH-58. We were about 30 minutes out on a scheduled 2-hour flight, and the pilot did a 180-degree turn and returned to the airport. But I also had to recognize the professional attitude of the pilot concerning the safety of his passengers and aircraft.

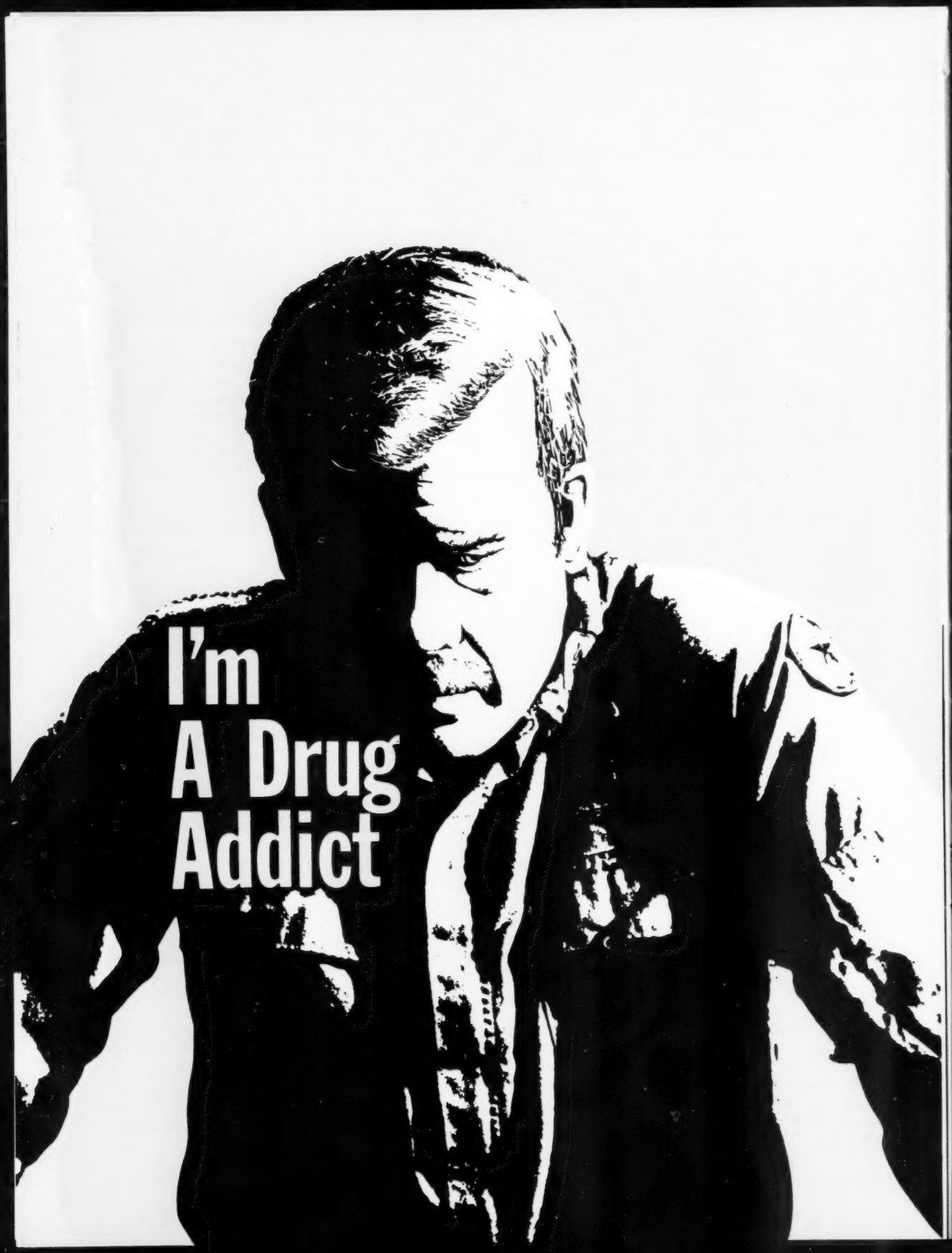
I was curious on several occasions as to why pilots and copilots made a big deal about passing the controls to each other. Since my involvement in aviation I now get the AVIATION DIGEST and APPROACH. There was my answer. APPROACH told of a helicopter flying off a ship with each aviator thinking the other had the controls. They realized their error only as the aircraft began to settle slowly into the ocean.

My office is not near a hangar or pilot ready room. But when I'm at the airport, it's good to hear pilots discussing safety practices in their bull sessions, and to see posters displaying those lifesaving messages. I have even eavesdropped on a master aviator as he counseled two young warrant officers because their 20-minute fuel warning light came on and they made a precautionary landing in a farmer's field. First came praise for their airmanship, and then he questioned their judgment for allowing this fuel shortage situation to occur in the first place. I hope his unkind words made a lasting impression on those two lads.

My turn to counsel came one day in the hangar when I saw a soldier, with a cigarette in his hand, spray painting a sign with an aerosol container.

Well, there it is. I certainly have not described the whole elephant. I'm sure a tower operator can come up with his hair-raising tales, and the crew chiefs and pilots have their experiences. The one sure thing I have found is that this safety business is everyone's business and we all should stick our noses into it.

If one flys them, fuels them, maintains them, rides in them or just stands on the ground enviously as they roar off, safety has to be part of their lives. There is no alternative.


I'm
A Drug
Addict

USAAAVS
CW3 Pierre R. Lefebvre
Aviation Safety Officer
Fifth U. S. Army Flight Detachment

GOOD MORNING, gentlemen! Welcome to the ninth installment of Pierre's Safety Class. This morning, we will talk about pilots and other strangers. The other strangers we'll talk about are depicted on the wall in front of you—the crew chief, the ASO, the commander, the typical W4, etc.

But first, I have something of extreme importance that I must say. It is a confession of sorts, an admission of guilt, whatever. I feel that you guys should know, because you are my fellow aviators and friends. This is a problem I've had for a long time. I did a lot of soul-searching before I was able to admit it to myself, let alone admit it to anyone else. You see, I'm a drug addict.

Now, before you jump up and call the Half Way House or the MPs, or FEB me, let me tell you how I got hooked on the stuff so you can possibly help your children and prevent their addiction to drugs.

It started for me when I was 19 years old, just before I came into the Army. I was working in a factory in Nashua, NH, and because of my age, I was known as the "Kid." Hey Kid, do this; hey Kid, do that. Acceptance by your peer group is a basic fundamental in the hierarchy of man. Use of drugs in that factory was everywhere, so in order to gain acceptance with my fellow workers, I tried the liquid additives. I didn't like them at first, but my tolerance built up rather fast. But more important, acceptance was starting to come my way. I was almost a part of the group. Well, through a little prodding and pushing, they got me to try the inhalant drugs. That was terrible. You see, I didn't smoke.

In order to gain the full acceptance of the group, I continued with drugs and eventually became hooked. That was the way to acceptance, being hooked. I didn't, at that time, realize the harmful effects these drugs would have on my body. The drugs were very easy to get. You could buy them on just about every corner in town.

When I went into the Army a short while later I started to have a hard time getting my drugs. Again I wasn't in the clique or in the group. Once I found the right people and made friends with them, I had no problems getting my drugs. Well, that was basic training.

In flight school, I got the drugs, but not enough of them. There was never enough because of the busy schedule. I graduated from flight school and was an officer going to Vietnam with plenty of money in my jeans. Everyone knows about the drug problem in Vietnam. I was in seventh heaven! I could get my drugs any time I wanted.

Fortunately, if you can call it fortunate, I never graduated to the hard stuff in Vietnam. You see, the peer group regulated me. To use hard stuff, you were out of the group. My fellow aviators and friends all used the additives and inhalants, but they would not touch opium or heroin. What are my drugs? They are caffeine and nicotine.

Caffeine—what does it do to you? Caffeine, one of a class of chemicals known as the xanthines, is still prescribed occasionally by physicians. Xanthines can, in varying degrees, cause central nervous system stimulation and cardiac stimulation. They also act as mild diuretics. Combined with other drugs, caffeine is sometimes used for headaches, particularly migrane, and in some "pain remedies," for example, APC tablets. Nonmedically, caffeine is the most widely used central nervous system stimulant, popular in the form of coffee, tea, cocoa and cola drinks. Heavy users of these beverages report tolerance, physical dependence with withdrawal symptoms and craving.

Yet caffeine can be a dangerous drug. The desired effects are remarkably similar to those of cocaine and amphetamines.

Caffeine stimulates all portions of the cerebral cortex. Its main action is to produce a more rapid and clearer flow of thought, and to delay drowsiness and fatigue. After taking caffeine, one is capable of a greater sustained intellectual effort and a more perfect association of ideas. There is also a keener appreciation of sensory stimuli, and reaction time to these stimuli is greatly reduced. This accounts for the hypertension, sometimes unpleasant, which some people experience after drinking too much coffee. In addition, motor activity is increased. Typists, for example, work faster and with fewer errors. However, this is where flying comes in. Acquired motor skills in a task involving delicate muscular coordination and accurate timing may be adversely affected. These adverse effects may be brought on by the administration of 150 to 200 milligrams of caffeine, the amount in one or two cups of coffee or tea.

In addition to its effect on the cerebral cortex and other portions of the central nervous system, caffeine in modest doses (a few cups of coffee or tea) affects the heart rate, heart rhythm, blood vessel diameter, coronary circulation, blood pressure, urine production and other physiological functions.

Coffee also has a marked effect on the human

metabolic rate. Numerous investigators have reported that the ingestion of 0.5 grams of caffeine (three to four cups of coffee) may increase the metabolic rate an average of 10 percent and occasionally 25 percent.

Is caffeine addicting? Opinions vary, depending on one's definition of addiction. One feature of heroin addiction is tolerance, the gradual fading effects as the same dose is taken daily. An appreciable degree of tolerance may develop to certain effects of the xanthines, especially the diuretic and vasodilator actions. Cross-tolerance between the members of the group also occur as it does among the various narcotics.

Another feature of heroin addiction is the withdrawal syndrome or physical dependence. Caffeine unquestionably produces withdrawal effects at certain dosage levels. There is no doubt that the excitation of the central nervous system produced by some amounts of caffeine is followed by depression. Research has shown that physical dependence does occur on five or more cups of coffee a day.

When taken in very large doses, caffeine is a potent poison. A fatal dose of caffeine given to an animal produces convulsions because of the central nervous system stimulating effect. Early in the poisoning, these convulsions are epileptiform in nature. In the final stages of the poisoning, death will occur from a respiratory failure. The fatal caffeine dose in man is estimated at 10 grams (70 to 100 cups of coffee or an average of four cups of coffee an hour every hour for the normal 18-hour awake period).

In animal experimentation, when we check out the behavioral effect caused by large doses of caffeine, even more shocking findings may be noted. Several research teams have reported, for example, that rats fed massive doses of caffeine become aggressive and launch physical attacks against other rats. More remarkable still, a caffeine-crazed rat may bite and mutilate himself. This mutilation was so acute and intense in some rats that these animals died from loss of blood.

Some of you may be moved to protest that the bizarre behavior of rats fed these massive doses of caffeine is irrelevant to the problems of human coffee drinkers. I agree 100 percent. However, there is a lesson to be learned from these rat reports. If the drug producing these effects in rats were marijuana, or LSD, or amphetamines, the report would be worthy of banner headlines on every newspaper in the country.

Now, let's talk about the effects of nicotine. Taken in the form of cigarettes, cigars, pipe and chewing tobacco, and snuff, its effects are variable. It can act as a stimulant, depressant or tranquilizer. Tobacco is one of the most physiologically damaging substances used by man.

Tobacco is a factor in cancer, coronary artery disease, emphysema of the lungs and other diseases. Since nicotine is one of the most addicting drugs in common use, most tobacco users are "hooked" and, as a result, locked to the damaging effects of the tobacco. At present, there is no known lethal dosage that can be administered through smoking.

The first modern scientific evidence that nicotine is addicting appeared in an English journal in 1942. Dr. Lennox Johnson reported that he had given small injections of nicotine solution to 35 volunteers, including himself. "Smokers almost invariably thought the sensation pleasant," and given in an adequate dose, were disinclined to smoke for a time thereafter. After 80 injections of nicotine, an injection was preferred to a cigarette. If the nicotine injections were abruptly discontinued, craving arose. A one-milligram injection of nicotine is roughly equivalent to smoking one cigarette, Dr. Johnson concluded that "smoking tobacco is essentially a means of administering nicotine, just as smoking opium is a means of administering morphine."

If it were not for the nicotine in tobacco smoke, people would be little more inclined to smoke cigarettes than they are to blow bubbles or light sparklers.

A certain level of nicotine in the brain is crucial for the dependent smoker. On the basis of studies, it is probable that nicotine is present in the brain within a minute or two after starting a cigarette, but 20 to 30 minutes after completing the cigarette, most of the nicotine has left the brain for other organs (e.g., liver, kidneys, stomach). This is just about the period when the dependent smoker needs another cigarette. The smoking pattern of the dependent smoker who inhales a cigarette every 30 minutes of his waking life (a pack and one-half a day) is such as to ensure the maintenance of a high level of nicotine in his brain.

Now just a word about the ease with which one can quit smoking. With most drugs, you get over the withdrawal symptoms in a few days, a week at most. But with tobacco, symptoms have been noted for six months and longer.

I'm not on a band wagon trying to stop all smoking and coffee drinking. Far from it. I drink coffee, perhaps too much, and I also smoke, perhaps too much again. All I'm trying to do is let you in on a few facts about legalized domesticated drug addiction and the effects of overindulgence. My facts came from a book entitled "Licit and Illicit Drugs" by Edward M. Brecher.

I must go now. It's been 30 minutes since my last cigarette and a cup of coffee sounds good.

If you have a question concerning aviation accident prevention, write to
Commander, USAAAVS
ATTN: Orval Right
Fort Rucker, AL 36360

Aircraft Maintenance Records

If a pilot wishes to see all the maintenance records of an aircraft, does the maintenance officer and maintenance personnel have to make all the records available to the pilot?

AR 750-31 directs that certain publications and forms be maintained in the aircraft for the crewmembers' inspection and use. No other known directive requires that the maintenance officer make all other aircraft records available to the pilot's inspection.

Specific reasons for your desire to view all aircraft records were not stated in your letter. Records other than those maintained in the aircraft are not normally required by the pilot for the planning, conduct or completion of a mission. However, a request by the pilot to the maintenance officer for access to or discussion about any aircraft records should reasonably be expected to produce the desired results.

Battery Storage

I recently read an article cautioning against associating anything used on or surrounding a nickel-cadmium battery with anything used on or surrounding a lead acid battery, air inclusive.

Our unit currently has 22 aircraft using nickel-cadmium batteries and five 7.5 KW APUs using lead acid batteries, so the problem is apparent. It is compounded, however, by the fact that these batteries share the same enclosed hangar space, approximately 80 feet by 105 feet, for several days or weeks at a time. Presently, it is not feasible to store the APUs outside the hangar due to weather conditions and our maintenance personnel are concerned as to whether or not 8,400 square feet, when enclosed, allows sufficient space to prevent damage to the batteries. We are also wondering about the possibilities of ordering nickel-cadmium batteries for the APUs. This would require justification from a higher level due to the cost differences of the batteries.

We therefore request any suggestions or guidance you can give.

The article you read was published primarily to warn maintenance personnel of hazards involved when caustic chemical agents of a nickel-cadmium battery and a lead acid battery are allowed to mix during battery charging and/or other battery services.

Storage of 7.5 KW APUs with lead acid batteries and turbine-powered aircraft with nickel-cadmium batteries in the same maintenance hangar should be of no major concern to your unit. The 8,400 square feet of hangar floor space should provide adequate ventilation for storage of both types of batteries, provided no battery maintenance is being performed.

Although the hangar space you mentioned is considered adequate, special precautions regarding ni-cad batteries should, nevertheless, be taken in accordance with TM 11-6140-203-15-1 and -2.

Your proposal for equipping APUs with nickel-cadmium batteries has been brought to the attention of the chief of the Support Branch, Avionics Division, USAAVSCOM, St. Louis, MO, for consideration.

IN 1805, MEMBERS of the Lewis and Clark expedition threaded their way into central Washington state into a valley now known as Yakima. In 1856, military units arrived in the area and established an Army garrison at Fort Simcoe. Today, Yakima Valley is the home of the Yakima Firing Center. Spread over more than 263,000 acres of land and staffed by approximately 400 military and civilian personnel, the Center is one of the busiest training sites found anywhere for active Army units. In addition, more than 10,000 Army National Guard and Reserve units train at Yakima annually.

Recently, Forces Command (FORSCOM) directed the 9th Infantry Division, Ft. Lewis, WA, to establish and operate a nap-of-the-earth school. The school was organized at the Yakima Firing Center under the auspices of CW3 John P. Daum and CW2 Thomas D. Pember of the 3rd Squadron (Air), 5th Cavalry, Ft. Lewis. Originally, the school was to train only those pilots assigned to Ft. Lewis. However, because of the Army's increased interest in NOE flight, Ft. Lewis was directed to train selected FORSCOM personnel as well. Some have come from as far away as Florida, Alaska and New Hampshire.

In June 1974, the school became operational. The course—3 weeks in duration—consists of 25 hours of classroom instruction and 15 to 20 hours NOE flying and navigating, followed by a 1- to 2-hour checkride. Sixteen aviators comprise a normal class. Ten to twelve of these are assigned to Ft. Lewis, with the remaining four to six coming from FORSCOM. All NOE training is under control of the School Command (Provisional), Ft. Lewis.

The NOE school enjoys a certain uniqueness by virtue of its geographic location. Situated centrally in the state, approximately 150 miles southeast of Ft. Lewis, it embodies almost every conceivable terrain feature among the 11 NOE routes used for training. These include flatlands, canyons, ridges, pinnacles and trees. Flight altitudes over the various ranges vary from approximately 550 feet msl to over 4,000 feet msl. Oddly enough, the school is not assigned aircraft of its own. These are provided by Ft. Lewis with each group of students.

As more and more units embark on their own NOE

Members of the Yakima Tactical NOE School staff pose in snow for photographer. From left to right are CPT Arch D. Bostley, DOI; CW3 John P. Daum, SIP; WO1 Brian K. Fletcher, Ground School/C&C Section; CW2 Phillip H. Garvey, IP; CW2 Robert L. Collins, IP; 1LT Howard H. Reed III, OIC, Ground School/C&C Section; CW2 Marvin G. Ballard, IP; CW2 Benson A. Edwards, IP; CW2 Billie R. Hinkle, SIP; CW2 Charles B. Sands and CW2 James L. Fitch, Ground School/C&C Section

training program, it becomes increasingly important that such training be thorough and be accomplished as safely as possible. Toward this end, we can only relate our experience.

Here at the Yakima NOE School, we have 11 assigned personnel as follows: one director of instruction (DOI), one officer in charge of the ground school and command and control section, two NOE standardization instructor pilots (SIPs), four NOE instructor pilots (IPs) and three ground school instructors. During the summer months, we are assigned five UH-1s and three OH-58s for the normal student load of 16 aviators. This allows us one spare aircraft of each type should maintenance problems arise. During the winter, because of inclement weather that often prevails across the mountains between Yakima and Ft. Lewis, we are assigned an additional aircraft of each type, allowing us two spares of each.

During the ground phase, we begin with an introduction to the mid-intensity war by explaining what a mid-intensity war is and what the pilot can expect to encounter in such a war; how Army aviators can expect to be used by the ground commander; and why we must fly NOE to survive and be able to complete our missions. Classroom instruction includes mapreading (Aviation Subcourse 75), threat briefings, fundamentals and conduct of tactical employment of helicopters, hazards to NOE flight and aeromedical aspects of such flight.

During the flight phase, the aviator learns such NOE maneuvers as takeoffs and approaches, ridgeline crossing techniques, quick stops, pinnacle approaches and takeoffs, masking and unmasking techniques, and emergency procedures. He also learns how to navigate and analyze terrain features while flying NOE. On completion of the course, he is able to navigate preselected routes as well as off these routes if given a mission change. In any case, he must always be able to accurately report his position, using six-digit coordinates.

Each aviator is also given the opportunity to fly in the command and control (C&C) aircraft at least once during the 3-week course. While flying C&C, he is responsible for pinpointing (six-digit coordinates) two UH-1s on the ground at any given time.

On completion of the course, the aviator is qualified to perform pilot duties (or IP duties) in an NOE environment and appropriate entries are made on the individual's flight records.

From our experience in establishing and conducting an NOE school, the need for thorough planning and stringent supervision in all areas of operations is a major requirement.

NOE ranges must be carefully selected and reconnoitered, and all hazards noted and included on maps. The erection of manmade obstructions or the appearance of new natural ones must be noted and the maps updated.

Equal care must be exercised when selecting instructor personnel. Our NOE IPs have an average of

YAKIMA NOE

7 years' flying experience and 3,100 hours flying time. All are UH-1 contact instructor pilots. In addition, three are dual rated, two are instrument flight examiners (IFEs), two are OH-58A contact IPs and two are CH-47 rated pilots.

Similarly, maintenance and servicing personnel must be experienced and dependable. A simple mechanical problem that would be of little consequence during normal flight can result in an extreme emergency during NOE flight. And fuel contamination, whether due to moisture or solid impurities, can prove disastrous. Obviously, all maintenance, inspections and servicing must be done by the book. The same holds true for preflight inspection. Memorizing check sheets or allowing one pilot to inspect "topside" while another checks "below" is strictly taboo. Pilots must know their aircraft and its systems thoroughly. They must know what they are looking for, and be able to detect any discrepancies that may exist. Likewise, cockpit check sheets must be used and operational checks accurately performed.

Yet, despite our best efforts, components can fail, and the pilot must be prepared to face an emergency situation at any given time. He must be able to rapidly detect a failure, identify the problem and take immediate action. Consequently, we include emergency procedures in our NOE course. However, it is important to note that we do *not* demonstrate these procedures. Practice autorotations to the ground, for example, during actual NOE flight would produce high risks that would outweigh any benefits they might provide. Nevertheless, emergency procedures must be emphasized during training to condition the pilot in the event of some in-flight problem. Here at Yakima, effective application of the safety system that provides checks and balances has paid off, and as of this date, we have completed more than 3,200 hours of NOE flight with no accidents or incidents and experienced only a single in-flight emergency. It occurred when the hydraulic system failed while the aircraft was being hovered at an altitude of approximately 3,600 feet msl, about 3 feet above a pinnacle. Needless to say, the aircraft was immediately set down on the pinnacle.

Briefings are another necessary function and are an integral part of planning. However, it must be pointed out that while briefings are necessary and beneficial, conditions in an actual tactical situation can change rapidly from those that existed at the time of briefing. Consequently, the aviator must be capable of modifying his mission, changing his route, and in general, deviating from the original plan at a moment's notice, usually en route. And this brings us to a most important area of NOE flight—navigation.

While every phase of training is vital to the safety of crews and equipment as well as to the success of any NOE mission, the area concerning navigation must be singled out for special emphasis. Of the 160 aviators who have completed the NOE course here at Yakima, none had difficulty in mastering the flying techniques associated with NOE. Yet each experienced some degree of difficulty in navigating. The reason is simple. We have come to rely on IFR charts, sectionals and tactical maps to guide us from one place to another. Of these, only the tactical map is of value to the NOE pilot. And while he is well versed in navigating by it while at 1,000 feet agl, with 20 miles visibility, he is hard pressed to do so during NOE flight. It is one thing for a pilot to navigate from an altitude that allows him to look down upon the terrain and quite another to do so while literally "on the ground," looking up at the terrain features with his visibility restricted to between 10 and 500 meters. And this is precisely the situation he faces. Even the most experienced pilot will find he must expend extra time and effort to become proficient in navigating NOE.

Finally, a word of caution: While it may be helpful to memorize terrain features along a proposed route, this procedure has little practical value in a tactical situation where changes in mission requirements force changes in routing. If the pilot has difficulty using a map to navigate, he will invariably be in trouble. The only solution is for each aviator to devote all the time and effort necessary for him to become thoroughly proficient in this all-important area.

The mission of Army aviation, according to AR 95-1, is "to contribute to the capability of the Army to conduct prompt and sustained combat." In the mid- and high-intensity battlefield of the future, because of the threat of enemy antiaircraft weaponry, we can no longer assume the position of air superiority. The days of flying the commander at 5,000 feet above the battlefield (C&C) are gone. The only way we, as Army aviators, will be able to "contribute to the capability of the Army" is to fly NOE. And we can expect to have to do just that. Thorough training in this relatively new concept is, therefore, vital. With proper planning and supervision, it can be accomplished safely.

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Our appreciation to the Greater Yakima Chamber of Commerce, Yakima, WA, for supplying historical facts and statistics relative to Yakima Valley and the Yakima Firing Center.

USAAAVS Captain Charles F. Nowlin

five minutes of chaos

WHEN I ARRIVED at the unit, it was with the usual apprehension of a new assignment coupled with the fact that this was my first reunion with the "real Army" after a year and a half in the hospital due to burn injuries I had sustained in Vietnam. As I began working back into the routine and started flying again, I found I was now aware of a few items I had overlooked before. Because of my burn injuries, I began paying much closer attention to my flight and life support equipment.

Assigned to operations, I was also able to look more at the airfield and its firefighting protection. One thing which caught my attention was our ill-kept firetruck. Upon closer inspection, I noted that the truck had no firefighting tools or equipment in its storage compartments or extra hose lines, ladder or even CO_2 extinguishers! It became a "fidgety" situation. So, I began looking for the firefighters and discovered we had two assigned but neither was school trained. One was on leave and the other had the day off because he had been CQ the previous night. Only one man, PFC Yonk, was qualified to drive the firetruck, and he had gone to the PX for a few minutes. I left a message for him to drop by upon his return.

About 2 hours later, into my office strolled PFC Yonk, an airfield refueler assigned to our POL section, and, after a 5-minute discussion, I came to the conclusion he wasn't exactly "playing with a full deck." A really nice guy but not of the "swiftest" quality. We ventured out to the firetruck and after numerous attempts finally gave up trying to start the beast. Our motor pool was notified that the truck was deadlined and I returned to my desk to "mull" over the morning "education."

I realized that after a year and a half of associating with "hurt" people, mainly burned, that I was living with a bit of paranoia uncommon to most people and only briefly noted by a few. I realized the

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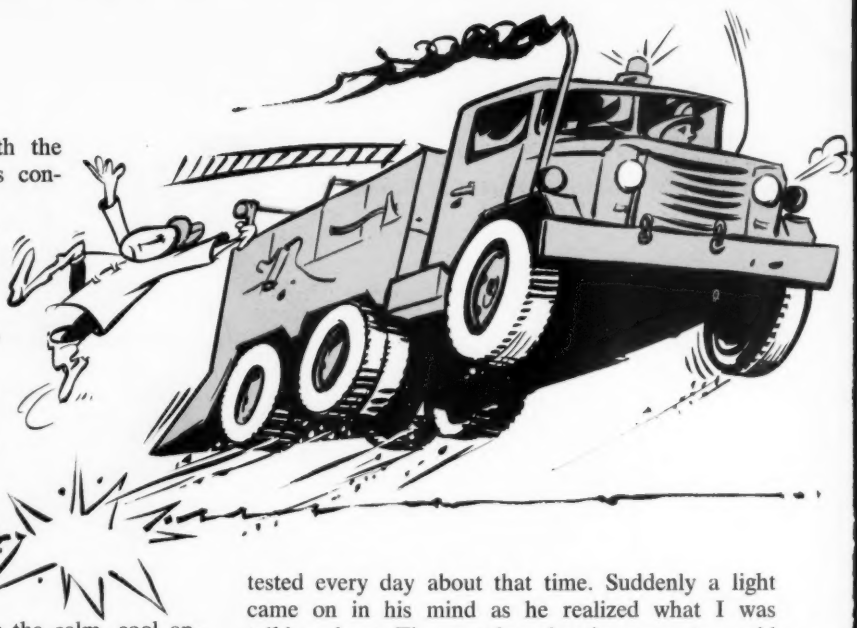
CPT Charles F. Nowlin sustained third degree burns to 35 percent of his body when his OH-6 helicopter was downed by enemy fire in the Republic of Vietnam in December 1970. He underwent 3 years of plastic surgery at Brooke General Hospital, Ft. Sam Houston, TX. CPT Nowlin returned to full flying status in July 1973. His expertise and dedicated work in the field of aviation safety and life support equipment earned him the McClellan Aviation Safety Award in 1974. He is currently assigned to the Officer Instructional Division, Directorate for Plans, Operations and Education, U. S. Army Agency for Aviation Safety, Ft. Rucker, AL



massive dangers associated with the very volatile JP-4 fuel, and its continued close proximity to our aircraft in flight, on the flight line and especially on field problems with such necessary practices as hot refueling. So I needed a rational, calm, cool, collected approach to begin a sincere, dedicated education program on this problem and to bring it to the attention of our unit. I began by yelling "fire" just to see what would happen. I did get their attention, although not very much happened except some wise acorn tried to douse me with a bucket of water. So much for the calm, cool approach.

We then began to train our own firefighters by selecting eight men from the POL section and following AR 95-26. We ordered all necessary equipment for the truck, had our avionics shop repair and reinstall the firetruck's radio and repaired the leaking pump (caused by leaving the vehicle on the flight line overnight unprotected from freezing temperatures). An E-6 interested in firefighting took charge of the two teams and work began in cooperation with the post fire department and the city firefighters. (Both departments were anxious to assist us with a great wealth of information.) We contacted the U. S. Army Troop Support Command which accommodated us by sending an outstanding instructor to help us for a week. We also notified an Army aviation National Guard unit in the city and they were most receptive to sending their firefighters and firetruck to our classes.

After several days of training, it was decided to give our firefighters a "dry run." Our aviation safety officer, with another pilot, crew chief and medic, took off in a UH-1 and simulated a crash about 3 minutes into their flight a quarter of a mile from the heliport. Then began the 5 minutes of chaos. I was in operations looking out the window and timing the reaction time of our crews.

On the initial alert signal nothing happened. PFC Yonk was outside our building trimming a hedge so I opened the window and asked if he heard any unusual bells. He thought a moment and finally said yes, but that the crash bells were tested every day about that time. Suddenly a light came on in his mind as he realized what I was talking about. The next few chaotic moments would have warmed the heart and soul of any Keystone Cop movie fan.

The shears Yonk had been using were almost slung into my face as he dashed madly for the firetruck. As I recovered from my first "dodge the shears" game, I mentioned to Yonk's counterpart, who had been observing all in a dazed stupor, that perhaps he should find out where the crash was. As he rushed into the building to get the information from the radio telephone operator (RTO), we heard the massive firetruck crank up and roar toward the gate with the sirens screaming and the lights flashing. Halfway out the gate, Yonk suddenly realized he was all alone and didn't know where to go. He slammed on the brakes, causing another fireman to miscalculate his leaping distance to the once-speeding truck and smash his teeth and shins simultaneously on the side of the vehicle (casualty number one). As the second firefighter raced out of the RTO's room, he was being hotly pursued by one A1, E-1, Army-issued, dyed-in-the-wool, combat-hardened, uncalled-for medic who also elected to leap onto the rear of the firetruck.

Again to the roar of the mighty truck and flashing lights, the excitement mounted as out the gate tore Yonk at the wheel! The first turn was negotiated correctly, because there was only one way to go! But as the truck arrived at the next corner, Yonk had to make a decision because the road turned into a "T." Yonk was alone in the cab while the two firemen and the medic were clinging for dear life to the rear of the truck. Yonk, not knowing which way to go, knew he had a 50-50 chance, so he made a left

turn. To the resounding clanks of pieces of equipment on his cab, plus the profuse usage of four-letter words by the men in the rear, he figured he was going the wrong way! So he again hit the brakes vigorously and immediately made a right turn, slinging off one of the firemen (casualty number two) and then almost running over him as the truck backed up. The fireman scrambled back aboard, loudly proclaiming some implications to Yonk's origin in his family tree.

Again the mighty truck roared in the correct direction another 200 meters to a point where Yonk saw a running helicopter to his left. He immediately swerved off the road and crashed over a small 18-inch-deep ditch, fully lifting all 10 wheels of the truck off the ground, thus giving us a one-of-a-kind "airborne qualified firetruck." The medic, who had been hanging on for dear life, was catapulted off the truck and landed on his shoulder and head, rendering him semiconscious (casualty number three).

In the running aircraft, the safety officer's eyes widened as he watched the 7½-ton firetruck leap toward him. He quickly grabbed the controls and hovered back to prevent the truck from crashing into the aircraft while simultaneously noting the flying medic landing on his head. As the firetruck finally stopped rocking, out sprang Yonk and the sole surviving semifit fireman to rush toward the aircraft. The safety officer immediately dispatched his medic and crew chief to police up the injured medic and evacuate him to the hospital. His sprained arm was set and he was again taught that, regardless of what his scrambled head told him, a hand had only five digits. He was released and given the day off to calm his shattered nerves, regain his respect for firetrucks and realize that his primary duty was as a medic rather than a makeshift fireman.

The total time involved to injure three men, almost wreck a firetruck and nearly destroy an aircraft was less than 5 minutes. Needless to say, training was increased and intensified with emphasis on the fact that speed is essential but not at the cost of incapacitating the firefighters so they are ineffective on arrival at the fire.

By the following week our fire eaters graduated with their walk through the flaming burn pit and even had television coverage by two local stations. All the lessons were learned, noted and built upon. We now had two competent and effective teams of firefighters in our unit.

A week later PFC Yonk appeared at my desk to announce his early retirement from the Army with a 70-percent medical disability. As I inspected him, I saw nothing unusual so I asked what he meant. "Oh," he said, "the doctors have just confirmed that I am classified as legally blind due to an eye disease" (casualty number 4). As Yonk contentedly whistled out of my office knowing he was going to return to his home with an income for life, I slumped into my chair for a long cry of relief.

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These events were not taken from M*A*S*H they actually happened. True, the overtone is humorous, yet this chaotic situation should not be taken lightly, as serious injuries could have occurred. To prevent a similar situation in your unit USAAAVS recommends the following reference material be maintained and complied with:

- Alarm system, command responsibility and preaccident plan—AR 95-5
- Firefighting and rescue—AR 95-26
- Fire prevention and protection (numbers and types of firetrucks)—AR 420-90
- 530B firetruck requisitioning, NSN 4210-00-202-8076—AR 420-3
- Firetruck 530B—TM 5-4210-200-10, TM 5-4210-205-12 and TM 5-4210-212-15
- Repairs and utilities fire protection equipment (inspections, operations, etc.)—TM 5-687

If special information or instructors are needed, contact: U. S. Army Troop Support Command, ATTN: AMSTS-NDC, 4300 Good Fellow Blvd., St. Louis, MO 63120, Autovon 693-3266, 7, 8, 9.

PEARL'S

Personal Equipment & Rescue/Survival Lowdown

Dual Visor

Questions have been raised as to the availability of a kit for converting the SPH-4 helmet visor assembly to accommodate the dual visor. Field modifications to incorporate the dual visor have been reported. Such modifications are dangerous, unprofessional and unauthorized.

The U. S. Army Aeromedical Research Laboratory (USAARL), Ft. Rucker, AL, in conjunction with the U. S. Navy and the Gentex Corporation, developed the SPH-4 helmet to provide state-of-the-art acoustic and crash protection to Army aircrewmembers. The tradeoffs of weight, configuration, electronics, etc., were carefully considered and the SPH-4 was standardized for the Army after detailed scientific evaluation.

The SPH-4 is critical in terms of total weight and distribution of that weight for maximum impact protection and crash survivability. Studies have revealed that 3.5 pounds is the maximum load that can be tolerated on the unrestrained head without unacceptable increase of the risk of head and neck injury during crash loads sustained in helicopter mishaps. Additional weight, in the form of a dual visor assembly, makes the SPH-4 helmet exceed the total weight of 3.5 pounds and, therefore, can produce injuries or fatalities in crashes that could have been survived. Ounces of additional weight, especially on the front of the helmet, can be amplified into over a 100-pound force during a crash. Added weight on the head can also cause fatigue of the muscles of the neck and back. If desirable and acceptable in terms of maximum weight and distribution, the dual visor would have been incorporated in the initial design of the helmet.

There is a Navy dual visor kit which will fit the SPH-4; however, neither USAARL nor the U. S. Army Agency for Aviation Safety (USAAAVS) will endorse the unauthorized modification of the helmet using this kit. SPH-4 helmets with dual visor modifications have been evaluated in an operational environment and have proven to constitute a hazard to the aircrewmember in the helicopter crash environment. They offset the center of mass of the helmet and have been implicated in causing undue neck muscle strain in the operational environment. The present solution is to wear the standard issue sunglasses under the clear visor. In the meantime, USAARL is continuing to evaluate helmets constructed of lighter material and the possibility of incorporating the dual visor system into these lighter helmets.

Intuitive solutions, in all probability, have already been evaluated by experts and there is a good reason why they have not been employed. Any suggestions that personnel in the field may have for improvement of any piece of life support equipment should be submitted to USAARL. The laboratory will carefully consider the bioengineering and medical aspects of such suggestions and, if they are found to be of merit, will help to introduce them into the system.

The Naval Safety Center has indicated that the U. S. Navy is returning to a single visor helmet as a standard item of issue. The change was due to Naval

If you have a question about personal equipment or rescue/survival gear, write Pearl, USAAAVS, Ft. Rucker, AL 36360

aircrewmember complaints. The major complaints were neck fatigue and muscle strain caused by helmet inertial loads in catapult launches.

Survival Radios

The RT 159/URC-4 and the RT 285A/URC-11 emergency radios were received by this unit with no TMs or batteries. Would you please furnish us with the NSNs for the batteries and the applicable TMs to use with these radios.

The RT 159/URC-4 radio is issued in lieu of the AN/PRC-90 survival radio. The URC-4 radio requires battery, dry, BA 1264/U, NSN 6135-00-548-2765, costing $30.50 each. Technical Manual 11-510 with Change 1 and TM 11-5820-341-12P cover operation and maintenance of the RT 159/URC-4 survival radio.

The RT 285A/URC-11 is issued in lieu of AN/PRC-90 survival radio and requires battery, dry, BA 1315/U, NSN 6135-00-295-0608, costing $32.33 each. Technical Manuals 11-5820-382-10, 11-5820-382-12P and 11-5820-382-35P cover the operation and maintenance procedure for the radio. The dash 10 covers the URC-14 radio only, while the dash 12P and 35P cover the URC-14 and URC-11. Both radios are similar in operation and maintenance procedures.

The above survival radios are rugged and reliable, and will provide an excellent means of communication in survival situations. The URC-4/URC-11 survival radio batteries are the mercury type and are expendable but recoverable. Additionally, the Electronics Command indicated the batteries are considered expendable after use under a survival situation and should be replaced to ensure maximum reliability.

USAASO Sez

The U. S. Army Aeronautical Services Office discusses

The FLIP

We've talked about FLIP before—but Flight Information Publications are your major source of data for transient, cross-country and enroute operations. The 21,000 Army aviators in the active Army, the National Guard and the Army Reserves constitute a potential editorial staff any technical publishing house would envy. And to the hundreds of you in the Army aviation community, including the many dedicated support personnel who have been contributing editors, our warm thanks. But now for those in the family who feel that "It's not my business"; "I'm new to this man's Army"; "In 'Nam, I really needed stuff on runway gradients, ammo availability, radio frequencies and such, but now . . ." and sundry other excuses—here's a little further dissertation:

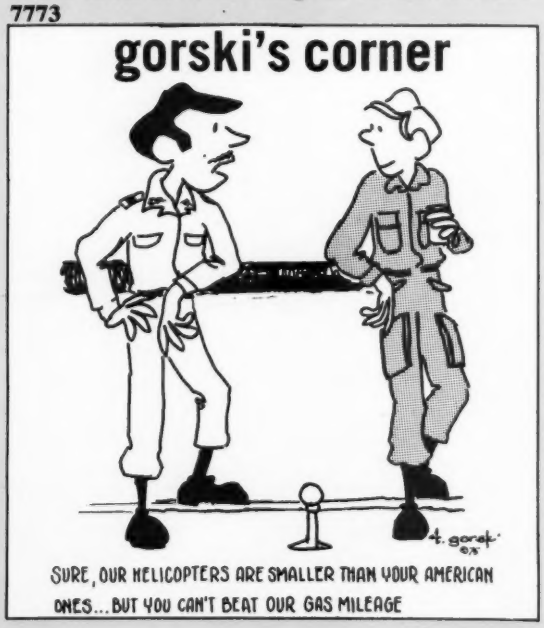
"IT'S NOT MY BUSINESS"—nonsense! Flying safety is everybody's business, and all those books and charts are to make your flight safer. The handful of USAASO personnel whose *sole* business it is are pretty well occupied just processing information, the actual data must by-and-large be submitted from field sources—YOU!

"I'M NEW TO THIS MAN'S ARMY"—so were we all once! If it's tough to understand, if you can't find your answer in the FLIP, the problem may not be you, maybe the system needs simplifying. As a very smart man said, "There's really no such thing as a stupid question." Through your new eyes, ambiguities, obsolete practices and outmoded procedures can be identified and modernized if practicable, or even eliminated.

The informal and direct door for communication with our office is wide open. Comment Cards addressed to USAASO or the appropriate detachment are available at most Army operations offices. Direct phone calls can be placed to USAASO or the detachments. Letters, wires, personal visits or any other means are OK too. The location, phone number and wire message address are available inside the front cover of your IFR (instrument flight rules) Enroute Supplement (para II C 3), page 2 of your VFR (visual flight rules) Enroute Supplement, in the appendix of AR 95-14 and in the Department of Defense (DOD) FLIP and Chart Catalog. But if you've got a briefcase in one hand and a helmet in the other, tell it to your airfield operations people and let them pass it on. Oh yes, continental United States (CONUS) aviators have the USAASO weekly "Army Aviation Flight Information Bulletin" with the communications data in the foreword and a monthly back cover which can be removed and folded for mail corrections.

The USAASO crew provides a Department of the Army point of contact and liaison with local flight agencies, as well as staff elements concerned with format and contents of flight products. Field data on air facilities communications, NAVAIDs and airways are processed promptly. Thanks to those many incoming reports from Army users, the responsible military or civil aviation authorities have been able to correct deficiencies and make things safer for all of us.

Alas, during those dull times when you're sitting around waiting for maintenance, a late VIP, good weather or simply 4 o'clock browse a bit in the DOD FLIP books and charts. We can't promise you a million laughs, in fact we hope your only snickers are at the crazy names some people give their airfields; you may, however, see an error or perceive a better way to put it together. Use the media described above to tell us about it. We'll change it! AUTOVON 284-7773



Military Personnel Center To Reorganize OPD

MAJOR CHANGES ARE in store for MILPERCEN's Officer Personnel Directorate (OPD). Under the changes, mandated by the requirements of the Officer Personnel Management System (OPMS), officers will be managed by OPMS specialties and grade.

Three Field Grade Divisions: By next fall, all field grade officers will be managed within divisions based on respective grades. Colonels have had this form of management since 1962. And all lieutenant colonels and majors—regardless of their branch—will be managed by specialties in the new majors' and lieutenant colonels' divisions.

Within the three field grade divisions, each headed by a colonel, there will be a professional development branch, support branch and multiple specialty management elements.

Specialty managers throughout each field grade division will be responsible for the professional development and assignment of officers.

For example, this means that a lieutenant colonel with Armor as his primary specialty would direct all his requests for information and assistance to the armor specialty manager of the lieutenant colonels' division.

An armor lieutenant colonel with information as his primary specialty would deal primarily with the information specialty manager in the lieutenant colonels' division.

Thus, an officer will normally look first to his primary specialty manager for guidance, assistance and professional development advice. However, he can still seek advice from his alternate specialty manager.

Three Company Grade Divisions: To provide company grade officers with a sense of organizational identity and pride, management of these officers by specialty and grade within the current branch framework will continue.

These familiar career branches will be retained under three new company grade divisions: combat arms, combat support arms and combat service support. A colonel will head each division.

The branch chiefs within each of the three divisions will be lieutenant colonels. The presence of respective professional development branches is part of an effort to insure continuity of officer development throughout the company grades.

New Warrant Officer Division: Management of all warrant officers will be centralized in a new warrant officer division. Only aviation warrant officers are now managed centrally by a single branch. All others are managed by their respective branches.

Formation of a single division offers distinct advantages since the problems associated with warrant officer management differ from those met in commissioned officer management.

For example, in highly technical areas such as Hawk missile maintenance, it is important for a warrant officer to maintain his proficiency. A central division could pinpoint an assignment, if necessary, for an ordnance warrant outside his branch in such areas as air defense where he could maintain needed proficiency.

Another problem that a central division meets is that of aviation warrant officers who are no longer physically required to fill aviation slots. A division set-up will help find more suitable assignments for these officers.

The changes at OPD will come during July-September 1975 by which time specialty designations for all captains, majors, lieutenant colonels and colonels will be complete. The new alignments in no way modify current branches of the Army as established by law but the major impact does occur at the career branch level.

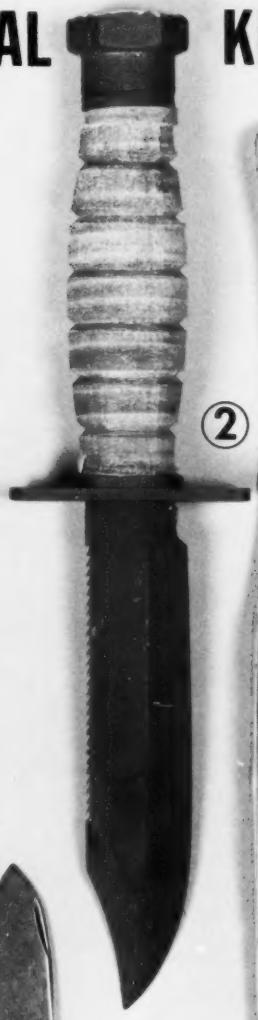
The assignment officer at MILPERCEN will play an expanded role in the professional development of officers whose assignments he oversees.

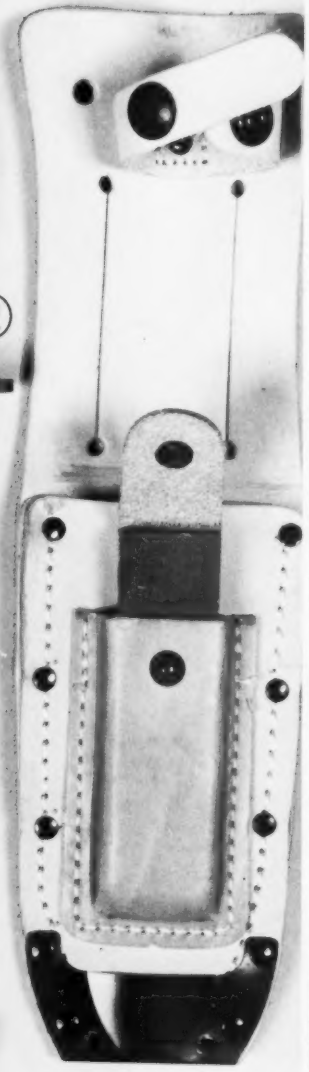
The professional development officer and the assignment officer will be free to coordinate with their counterparts in the other divisions, and at the deputy level, on assignment matters and other actions affecting the individual officer.

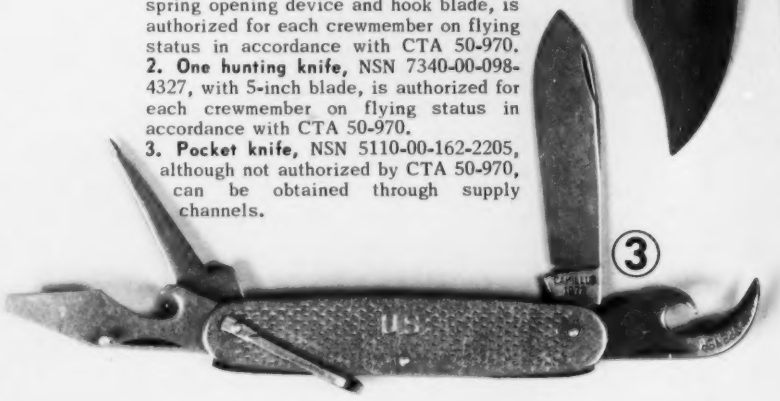
A "specialty monitors" element in the professional development branch will coordinate professional development efforts in the divisions. Specialty monitors also will be the points of contact for outside agencies wanting to coordinate plans and policies about any of the specialties.

The reorganization of OPD will be carefully handled to insure a smooth transition from the current branch/grade system to a specialty/grade system.

SURVIVAL KNIVES







All aircrewmembers should carry a survival knife. It is the commander's responsibility to make knives and other survival equipment available for each aircrewmember. While many different types of knives are available through Army supply channels, USAAAVS recommends the following approved survival knives. The pocket knife (item 3) is included in all survival kits listed in CTA 50-900 and can also be ordered as a separate component.

1. **One pocket knife,** NSN 5110-00-526-8740, with 3 1/16-inch cutting blade with spring opening device and hook blade, is authorized for each crewmember on flying status in accordance with CTA 50-970.
2. **One hunting knife,** NSN 7340-00-098-4327, with 5-inch blade, is authorized for each crewmember on flying status in accordance with CTA 50-970.
3. **Pocket knife,** NSN 5110-00-162-2205, although not authorized by CTA 50-970, can be obtained through supply channels.

This is the seventh of 12 back covers designed to show personal survival, rescue and protective equipment. Detach this cover for your bulletin board display of the more important survival and protective equipment available to crewmembers.

7 USAAAVS OF 12